

**Unplatformed Design: Reconceptualising Social Media
Technologies as Tools for Coordinated Action,
Participation and Engagement**



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Abstract

Social media technologies are becoming more and more enmeshed in our personal, professional and civic lives. Increasingly, we are just as likely to use social media to book a doctor's appointment as we are to make plans with friends. This ever-widening context of use is a testament to the versatility and flexibility of these types of technology, and points to their potential for shaping, structuring and supporting new ways of participation, engagement and interaction. The aim of this thesis is to explore this idea through designing with, investigating and reconceptualising social media technologies.

With respect to existing literature around the appropriation of technologies and the materiality of information, I argue that social media can be conceptualised as a 'design material' from which other forms of participation can be created. To support this, I undertake the design, deployment and evaluation of a large-scale social media-based participatory engagement, 'WhatFutures'. From insights generated in this design process, and with an accompanying analysis of other empirical examples of appropriation of social media for participation, I then propose the model for 'unplatformed design'. This conceptual model details the material qualities of social media technologies in respect to how they can be appropriated in the coordination of participation. Lastly, I put this model into practice in two design-led case studies: in the design and deployment of a peer support system for people undergoing extreme weight loss as part of managing diabetes; and in the formulation of design considerations for a social media-based language learning system.

There are multiple outcomes from this is conceptual, empirical and design-led inquiry. I fully detail the final designs and corresponding design processes of two full large-scale, social media-based engagements. I present and interpret a variety of design decisions around the appropriation of social media for coordinating participation. Crucially, I introduce the novel model of unplatformed design, identifying four material qualities of social media technologies, and how they may be configured or augmented towards coordinating participation. This model fundamentally reimagines the role and possibilities of social media

technologies within design, it looks past existing perceptions and ingrained usage patterns, and proposes a more constructive and participatory orientation of social media to our lives.

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For my son, Abel

Publications

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Chapter 1 Introduction

1.1 Overview

“Now is no time to think of what you do not have. Think of what you can do with what there is.”

Ernest Hemingway

I remember reading an article, Instagram is the New Evite (Lorenz, 2018), which detailed the phenomenon of teenage ‘party accounts’ on Instagram¹. The article described how when teenagers in the US are planning a large party, they’ll sometimes create a new Instagram account. The account will be given a name that includes the date of the party e.g. ‘@Nov17party or @SarahsBdayOctober27’ rather than being named after a person. The account will be private, so that only specific people can view its content, and its bio will include information for the party, rules for attending and who is organising it. Importantly, there will be additional stipulations such as ‘follow the account if you want to come. If we follow you back, then you’re invited’. These accounts also act as promotion, increasing the sense of ‘hype’ and excitement. Often so much so, that many are cancelled due to overwhelming attention placed on their teenage organisers, way before the location of the party is finally sent out to invitees.

Reading about Instagram party accounts, I was struck by a number of things. Firstly, I was amazed at the ingenuity and resourcefulness of the teenagers in how they had transformed

¹ a popular social media application focussed around self-expression through the sharing and commenting of images <https://www.instagram.com/>

Instagram into a party RSVP service, a guest list manager *and* a promotional tool all just by using existing features in new ways, and with not one line of code. I was impressed at how they had placed their own meanings and significances onto the features of Instagram, in a way that completely ignored the intended usage patterns of the app. Lastly, and most importantly for this thesis, that if this could be done for party planning, could it be done for other forms of participation? It is not a huge leap to move from party planning to workshop organising, and from social events to work engagements. Can the same resourceful appropriation of social media be turned towards supporting participation in civic life? Or for creating support networks in health? Or online learning environments?

This thesis investigates the ways in which existing social media technologies can be appropriated for the design of new ways of structuring and coordinating participation. It explores the different ways in which popular, widely adopted social applications can be creatively reused and how they can be resourcefully reapplied to new contexts. This involves a reconceptualising of social media, that breaks through ingrained perceptions and intended usage patterns, and instead repositions social media technologies as *raw material*, from which new patterns of participation, engagement and interaction can be shaped, structured and supported. The phenomenon of using social media to support such processes is not a new one, it exists in the use of twitter syntax to convey crisis information in disasters (Starbird & Palen, 2011), to the delivery of court summons via WhatsApp² (Sura, n.d.), to patients using social media to track and report health conditions (Grajales, Sheps, Ho, Novak-Lauscher, Eysenbach, et al., 2014), and to entirely self-organized groups within social activism (Crivellaro et al., 2014). The fact that it can be employed so effectively in supporting such a variety of processes, in disparate domains and with so many different communities, is a

² At the time of writing, the world's most popular instant messaging application. <https://www.whatsapp.com/>

testament to the power, flexibility and ubiquity of social media technologies. It is precisely these properties that this thesis examines, drawing as it does from empirical studies into the appropriation of social media to contribute a model for the appropriation of social media technologies. It is my hope that this model may help others to see more clearly, and thereby harness more effectively, the potential of appropriating social media technologies for the coordination of participation.

Designing ways for citizens, stakeholders and communities to participate in projects is a key concern of organizations, institutions and researchers. Coordinating participation, which I define as *the creation of processes, activities and tools that seek to engage people in working towards a particular goal*, may be oriented towards data collection, decision making, insight generation, ideation, activism and more. Although the goals of participation are varied, they all face similar design challenges such as how to motivate and engage participants; how to structure collaboration and communication, and how to provide effective channels of participation. This is particularly relevant when working in resource constrained settings where the introduction of new or novel technologies may increase barriers to participation.

At the same time, the pervasiveness and popularity of social media technologies is truly staggering. In January 2019, 3.484 billion people globally were classified as active social media users (45% of the world's population) (Kemp, 2019), and it is becoming commonplace to use communication apps like WeChat and WhatsApp to communicate with employers, colleagues, teachers, businesses, doctors and more. As social media technologies become increasingly incorporated into the mechanisms of civic life, the need for an alternative to conventional ways of designing bespoke technologies and platforms for participation becomes clearer. One such way is through designing of social structures and processes that build on top of existing, widely adopted, social media technologies. Although the utility of this genre of participation design has begun to be demonstrated through its increasing prevalence in everyday life, a proper understanding of this approach has yet to be articulated.

1.2 Research Journey

My previous academic background was quite far removed from computing science (a BA in Philosophy) at least in a practical sense. Instead I have come to this PhD and its area of inquiry from my experiences as a designer, and as someone whose previous employment involved working closely with teenagers and trying to engage and excite them about contemporary art (not an easy task). In regards to my design experience, I have always been a resourceful designer. I distinctly remember when after being taught in secondary school how to create 'macros' to automate tasks in Microsoft Excel, I immediately set about (mis)appropriating Excel to create a game. The game used macro buttons to represent player's choices in a branching narrative full of twists and turns. I spent hours modifying and tailoring excel to create it, so much so that it quickly became way too big to fit on a floppy disk, and my friends would have to crowd around my PC, when the teacher was otherwise distracted, in order to play it. I did the same with PowerPoint animations the following term. Having lacked the knowledge or access to the tools to create games through code, I used what was at hand.

In a previous role, directing the young people's programme at a contemporary art gallery, is where I first gained an appreciation of the ways in which social media could and are being used by young people. It is also where I became aware of the significant barriers to digital participation that young people face. Consider for example the steps a 16-year-old must take in order to access an art gallery's bespoke application. First, they have to have own a smart phone (admittedly this is increasingly more common). Next, they need to be aware of the app's existence (an issue of marketing and awareness). Next, they need to download it from the app store, this may require a credit card on file even if the app is free. Finally, upon opening the app they often are required to create an account, or sign up with an email, which they may not have, or not be able to do. All of these issues are further compounded if the young person is from a disadvantaged socio-economic background.

It is with these concerns that I began this PhD, originally aimed at investigating the ways in which young people's access to galleries and museums could be improved through better

design of digital technologies. However, like many research journeys, the central contribution of this thesis was neither the point of origin for the research, nor the initial intended destination. Early on in the process of inquiry I had the fortune of collaborating with the International Federation of Red Cross and Red Crescent Societies (IFRC), the largest humanitarian organisation in the world with approximately 17 million volunteers (Hazeldine & Smith, 2015). The design problem they presented was a familiar one for many organisations of that size, that of meaningfully engaging their distributed members in a participatory process. In this instance the particularly compounding factor was that the majority of these volunteers were also in a technologically constrained developing world context, further restricting the possibilities of digital engagement.

The solution I came up with was to design a collaborative game, but one that could be played on software that was already widely adopted by the target audience, thereby lowering the barriers of participation. The design process, deployment and evaluation of this game (WhatFutures) can be found in chapter 3. I had initially conceived that the innovation at the heart of WhatFutures was in its use of gameful and game-like elements for engagement, due to my previous experience as a game designer and my interest in investigating the concept of civic engagement games (Gordon et al., 2016) as the focus of my PhD. However, upon reflection, it became apparent that the real successes of the game (compared to IFRC's previous attempts at engagement) were due to the fact that it was played through WhatsApp. Designing with WhatsApp had led to the creation of a robust, scalable and truly global participatory process. One that required little expense in terms of time, money or technical resources, and that lowered the barriers of participation in a way that meant a rural volunteer in Kenya had as much ability to contribute as an urban dweller from Hong Kong.

Building from this revelation, I then set out to better understand the design space of using social media technologies for the design of new forms of digital participation. In order to achieve this, I systematically analysed the design decisions of a number of empirical case studies (including WhatFutures) in respect to how they had used social media to structure and support participatory processes (chapter 4). The intention behind this analysis was to

draw out commonalities in support of the development of a model. The analysis was underpinned by a conceptualisation of social media technologies as *design material*, based upon work by Dourish (amongst others) on the materiality of information (Dourish, 2017) as well as research on the appropriation of existing technologies (Cobb et al., 2014; Wiggins, 2013; Dix, 2007). The result of this analysis is the model of *unplatformed design*, so called in that it does not involve the creation of new platforms to sustain a process of participation, but rather utilizes the materiality of existing social media technologies. I regard this model as the central contribution of this thesis.

As detailed in chapter 4, the model for unplatformed design is intended to have both *descriptive utility* and *pragmatic utility*. Practically speaking, it allows designers to reflect more clearly on the qualities of social media technologies and how they may be employed in the design of participatory processes. In order to validate the model in these terms, I then embarked on two separate unplatformed design processes, in two distinct domains. The first was the design of a social media-based peer-support system for participants undergoing extreme weight loss as part of the Barbados Diabetes Reversal Study 2 (BDRS2). This involved a multi-phased co-design process, steered by the unplatformed design model, and the creation, deployment and evaluation of the resulting social media-based system. All of which is detailed in chapter 5. The second process involved the use of the design model to better understand the potential design space for using social media technologies in language learning within a higher education institution. This constituted two exploratory design workshops based upon the model, and a consequent qualitative analysis to uncover insights informing design recommendations.

The three case studies in this thesis all come from diverse domains (humanitarian strategy, public health, language education). This heterogeneity is a result of me taking advantage of opportunities as they emerged through collaboration and contacts during my PhD. These opportunities took the form of real-world problems encountered by collaborators, such as the need to engage globally distributed volunteers, to design a peer support for a health intervention, or ways of adopting social media in the language learning classroom. However,

their diversity was also deliberate as it ensured the formulation of a model that was flexible enough to account for the unique challenges of these disparate domains, whilst also focussing on their commonalities (e.g. how to engage, motivate, and support social interactions). Indeed, when focussing on concerns that are shared between the domains, it is clear that the social design challenges of civic participation and engagement are conceivably more similar across domains than they would first appear.

I expect the research outcomes of this thesis to be valuable to both HCI researchers involved in the design of participatory processes and engagement, and also to organizations and institutions embarking on engagement projects that seek to include the voices of large and diverse groups of stakeholders.

1.3 Definition of Terms

Throughout this thesis I utilise a number of key terms. The concepts represented by these terms are central to the research, and so to avoid ambiguity I present definitions here.

1.3.1 Social Media

This thesis defines social media technologies as not only referring to social media websites and applications (e.g. Twitter, Instagram), but also to messaging applications (e.g. WhatsApp, Messenger, Viber) and those which incorporate wider activities such as shopping and digital games (e.g. Facebook, WeChat). As social media continues to rapidly evolve, any rigid definition will be almost instantly incompatible and out of date. As such this thesis adopts a broad, widely encompassing, definition that covers most digital systems that facilitate connections between users to form a network, and that enable users to produce and share multimedia content, both privately and publicly within that network.

1.3.2 Coordinated Participation

This thesis defines coordinating participation as the creation of processes, activities and tools that seek to engage people in working towards a particular goal. The term ‘participation’ comes with a fair amount of conceptual baggage, linked as it is to practices of participatory

design (Gregory, 2003) itself a very contested term (Vines et al., 2013). Here participation is again meant in a broad sense, referring to any process, activity or engagement that seeks to include people, whether that be in health, education, work or civic life.

The choice of coordinated participation (as opposed to coordinated action) is a deliberate one. Coordinated action (Lee & Paine, 2015) is a broader term emerging from the field of computer supported collaborative work (CSCW) that refers to any goal-directed collaborative activity, with an emphasis on work. Whilst some of the concepts discussed in this thesis may well apply to coordinated action, I deliberately refer to participation as civic participation is a motivating concern throughout this thesis (which I will discuss in more detail in the following chapter). Furthermore, the case studies and empirical work within this thesis are all civic participatory in nature, specifically within the contexts of health, education and humanitarian work, therefore the term participation is more accurate to the concerns of the research, and more explicitly connects the work to civic forms of engagement.

1.3.3 Appropriation

When I refer to appropriation in this thesis I use Paul Dourish's broad definition (Dourish, 2003), which he defines as *'the way in which technologies are adopted, adapted and incorporated into working practice. This might involve customisation in the traditional sense ... but it might also simply involve making use of the technology for purposes beyond those for which it was originally designed or to serve new ends.'* As an additional point of clarification, Dourish's emphasis on 'working practice' I take to include any practice where an individual or individuals are working towards a goal, most relevantly for this thesis, this includes coordinating participation.

However, there is a point of divergence between appropriation as it occurs in this thesis and how it is described by Dourish. Whereas Dourish's definition of appropriation is useful for design conversations around how we can *design for appropriation*, that is to make appropriation of a technology easier and/or more likely to happen (Dix, 2007; Dourish, 2003), this thesis builds on this, and frames appropriation as an approach to the design of

coordinated participation. In this way, I move towards *design through appropriation*, and use Dourish's definition as a way of understanding a range of appropriation practices that can be used in the design of coordinated participation.

1.3.4 Materiality

The concept of materiality typically refers to the quality that physical objects and substances have as being material with material properties. From a making perspective, an understanding of an object's materiality is crucial to understanding what you can do with that object. Similarly, in this thesis, when applied to social media technologies, materiality is used as a metaphor for understanding those digital qualities of social media that determine what can be done with it. The conceptual underpinning of this metaphor is unpacked in more detail in chapter 4. As an additional note, at no point in this thesis is the term materiality used to describe the physical consequences of digital infrastructure (e.g. server farms, power costs, mineral resources), which is of course an important but entirely separate issue.

1.4 Research Questions

The research described in this thesis explores the ways in which social media technologies can be appropriated in the design of coordinated participation. It does this through three research questions. The first is broadly empirical, concerned with inquiry into the real-world design and deployments of participatory processes supported by appropriated social media technologies. The second is broadly conceptual, concerned with the formulation of a model of appropriation that accurately and productively charts the design space of designing with social media technologies. The third addresses the translation of these conceptual findings towards design in practice.

RQ1: How can existing social media technologies be appropriated in support of engagement and participation?

Though broad, this important question has helped direct this thesis throughout the course of its writing. It does this by maintaining a focus on empirical examples of appropriation, as done

in real life. The vast majority of appropriation happens outside of academia, by people and organisations using ad hoc assemblages of technologies (Wiggins, 2013; Volda et al., 2011) or at-hand tools (Cobb et al., 2014) to respond to real world needs (Hou & Lampe, 2015). This is important, for two reasons. Firstly, as it is a seemingly never-ending source of inspirational creativity and resourcefulness (for example see how teenagers use Instagram for party planning (Lorenz, 2018) or appropriate the chat function of Google Docs (Lorenz, 2019)). Secondly as understanding how people actually use technology (often in ways that were never intended) enables us to learn how to be better designers.

Related to this point, this research question also helps maintain a focus on the features and functions of social media itself, particularly in how they may be employed in the design of coordinated participation. This is particularly useful when it comes to actually developing and deploying a novel system, where an appreciation and understanding of *what social media can do* assists the design process. In chapter 3 I detail the design process of WhatFutures, a key part of this was an empirical understanding of the features and functions of WhatsApp, and a corresponding understanding of how these features may be appropriated in sustaining a process of process of participation.

RQ2: How can we reconceptualise social media technologies to make them more readily usable as a resource for the design of coordinated participation?

Whilst the previous question looks at empirical examples of social media appropriation, this broadly conceptual question looks to translate that knowledge into a usable conceptual model. To do this, it focusses attention on theories of design, in terms of understanding the ways a conceptual model may have utility within design. The question also focuses attention on existing concepts of social media technologies, particularly on how these may be replaced, supplemented or otherwise built upon. To do this, I draw upon theories of the *materiality of information* (Dourish & Mazmanian, 2013).

This question also helps to draw conceptual commonalities across a diverse set of examples of appropriation of social media technologies, by focussing attention on those commonalities that are more readily employable within design. It helps ask, why has a designer chosen to configure social media in this way? Primarily, chapter 4 details the findings of this conceptual enquiry, and proposes a resulting model for unplatformed design. However, this question also guides the reflection and evaluation found in later chapters, where the model is applied in practice

RQ3: How can a model of appropriation of social media technologies for coordinated participation be applied in practice?

The previous research questions are broadly empirical and conceptual, inquiring about appropriation of social media technologies, and the drawing of a model based upon conceptual commonalities between them. However, the aims of this thesis speak to the design of new of coordinated participation through social media technologies.

As such this research question, as well as heralding a return to practice and design, also acts as a synthesis between the empirical and conceptual. It focusses enquiry on the utility of the model for unplatformed design in terms of how it can be applied to real world design processes. It does this in two ways, firstly by translating the conceptual model into interaction design workshops and techniques. Secondly, by reflecting upon the unique characteristics of these unplatformed design processes in terms of their utility and application, but also upon the end products of those processes and the extent to which they embody these characteristics. These questions are primarily addressed in chapters 5 and 6.

1.5 Methodology

The research questions outlined above seek an empirical and conceptual understanding of the ways in which social media technologies have, and can, be appropriated for creating new forms of participation. As such the research approach I have adopted is threefold. Firstly, conducting design led enquiry of appropriating social media in a real-world context. Secondly,

a conceptual enquiry into the nature of appropriation, as informed by current practice. And lastly, a synthesis of design-led inquiry and qualitative fieldwork to further refine and reflect upon the relationship between conceptual models and practice within real-world contexts.

With this three-pronged approach I aim to create a rich and detailed account of appropriating social media for participation as it has been applied in practice, and also to constructively point to the ways in which it can be applied in the future. I provide an overview of my methodology here, but note that each successive chapter in this thesis contains more detailed methodological descriptions that pertain to the specific contexts of each study.

1.5.1 Design-led inquiry

A principle pattern to all the design-led work detailed in this thesis is that it takes place in the real world, and importantly, responding to a real-world need. In this way, this research approach is very much rooted in the specific contexts, complexities and constraints of working to address genuine problems experienced by communities and organisations.

Therefore, the design-led approach I take in this thesis can be broadly categorized as responding to '*constructive problems*' in HCI, in that my approach is '*aimed at producing understanding about the construction of an interactive artefact for some purpose in human use of computing*' (Oulasvirta & Hornbæk, 2016). These types of problems are the points of departure for my design led inquiry. A typical example of this problem can be found in chapter 3 in the form of '*how can you use WhatsApp to engage large numbers of distributed volunteers in a participatory foresight activity*'. The answer to which was hitherto unknown, but through the process of designing I produced understanding about the ways in which social media may be appropriated for such a purpose.

It is also worth stating that at least initially, I responded to these sorts of problems from my own previous knowledge and experience as a designer. In one respect, this was born out the same attitude expressed in the quotation at the start of this chapter, that of making the most use of what is at hand. But in another (albeit related) sense, from principles of design that

prioritise rapid iteration and ‘quick-and-dirty’ prototyping techniques. Although these tenets (or something akin to them) can be seen across all design traditions, it is the principally the practice of game design that has most influenced my attitudes to design-led inquiry. Significantly, the work of Jesse Schell whose various game design ‘lenses’ (Jesse Schell, 2008) inform my attempts to reframe prosaic uses of social media features into something more playful and gameful; Eric Gordon’s design work (Gordon et al., 2016) in transforming civic spaces into spaces for meaningful play; and Jane McGonigal’s large-scale designs (McGonigal, 2011) that aim to capitalize on the transformative potential of play when enacted through large-scale distributed technologies (e.g. social media). In this way, my design practice has moved from the design of games, to the design of social systems and processes that use gameful and game-like structures.

1.5.2 Conceptual Approach

In order to answer the diverse research questions above, the conceptual basis for this work is located in three main areas; existing literature on the phenomenon of appropriation of technology; on conceptions of the materiality of information and digital systems; and on attempts to bring theory and practice together into a coherent concept of making.

As a principle concern of HCI is the ongoing development and improvement of digital systems, research into the phenomenon of appropriation has led to the development of several theories of appropriation (Stevens et al., 2009; Dix, 2007; Dourish, 2003). All of which are underpinned by studies of empirical examples of appropriation in practice, and are aimed at translating insights into concepts that can be applied to the design of new technologies. As the research questions in this thesis are similarly concerned with the formulation and application of conceptual insights, existing theories into appropriation make for a natural theoretical starting point.

“After a while one old, but broad bladed screwdriver becomes ‘the’ paint-tin opener. What was once a temporary use of a tool has become specialised. This crystallising of appropriation leads to a new tool and the entrepreneur might spot this, notice the particular kinds of screwdriver

that made good paint-tin openers and then design a special purpose tool just for the job. By observing the ways in which technology has been appropriated, we may then redesign the technology to better support the newly discovered uses.” Alan Dix (Dix, 2007) p29

The conceptual approach in this thesis is also informed by notions of the *materiality of information* as expressed by Paul Dourish in his book *The Stuff of Bits* (Dourish, 2017). Making a move from the materiality of digital systems as referring mainly to the physical and resource footprints of supporting infrastructures, Dourish instead argues that materiality is also a property of the information contained within those systems. He describes it as:

“...those properties of representations and formats that constrain, enable, limit and shape the ways in which those representations can be created, transmitted, sorted, manipulated and put to use – properties like robustness, consistency, compressibility, malleability...” Paul Dourish (Dourish, 2017) p26

Or to put it another way, the way information is materially configured ultimately affects what we can do with it. This conceptualisation of materiality, as meaningfully applying to non-physical things, is an important idea within my conceptual approach. Particularly in respect to my attempt to reconceptualise social media technologies in terms of design material.

1.5.3 Field work

The latter half of this thesis returns to a process of design-led inquiry as it seeks to apply and validate the conceptual models formulated in the previous half. This is further investigated through a process of reflective and empirical evaluation on the design processes employed. The primary methodological approach I used to both inform and evaluate this synthesis of theory and practice is qualitative field work.

In the main, this took the form of group workshops with participants in which a variety of interaction design techniques were used to generate rich discussion of social media and the ways in which it may be appropriated towards specific goals (peer-support for diabetes management and peer-led language learning). The discipline of interaction design (Fallman,

2008; Goodman et al., 2011; Löwgren & Stolterman, 2004) is uniquely placed to generate such discussion as *'interaction design takes a holistic view of the relationship between designed artifacts, those that are exposed to these artifacts, and the social, cultural, and business context in which the meeting takes place'* (Fallman, 2008).

Primarily these workshops generated discussion data, which was analysed through inductive thematic analysis (Braun, 2006). They also generated field notes, researcher observations and workshop artefacts, all of which were triangulated with the discussion data in order to generate rich or 'thick' descriptions (Geertz, 1973) of participants' past, present and crucially, future use of social media technologies within the context of participation and engagement. These rich descriptions are used both generatively (to inform the design of new ways of appropriation) and evaluatively (to assess the validity of designs). Both these uses however feed ultimately into an appraisal of the central concepts of this thesis, that of a model for the appropriation of social media for coordinated participation.

For the purposes of this thesis, even though quantitative data about the use of social media was collected (through logs etc.), it was primarily only used only to inform and structure the qualitative field work, or to provide additional points of triangulation in the analysis of qualitative data. This was a deliberate decision as focusing on quantitative data would create the danger of reducing the rich complexity of social media technologies to usage statistics and engagement metrics. Contrastingly, attempts were made to measure engagement in qualitative ways, through workshops with participants who used the designed systems in order to paint a fuller picture of lived experience.

1.6 Thesis Structure

In order to accurately capture the narrative journey of this PhD, the chapters in this thesis are presented largely in chronological order. In this way I hope to describe how the approach to designing with WhatsApp for the IFRC led to the creation of the central conceptual contribution of this thesis - the model for unplatformed design - and then how this model is

then translated back into practice in two different contexts. The thesis is structured as follows:

Chapter 2 comprises the literature review and is split into three main parts. In Part 1, I introduce participation, within civic and organisational contexts, as something that is designed. From here I develop an understanding of online communities, and link these to the concept of *communities of practice*. In Part 2, I move from the design of bespoke technologies for participation to look at examples of where social media has been appropriated for civic participation in real world contexts. Part 3 focusses on HCI theories and models of appropriation and develops an understanding of appropriation as an example of *practice*. I then relate this to extant models of appropriation within HCI, specifically CSCW, where appropriation is conceptualised as an ongoing process of negotiation between digital artefact, users, and societal/cultural/work factors.

Chapter 3 details the first major study of the thesis, the large-scale collaboration with the International Federation of Red Cross and Red Crescent Societies. It comprises of a small literature review to introduce the research context, and introduces the nature of the organisation and the particular design challenges of the deployment. This chapter includes the full design process of WhatFutures, the WhatsApp based global game I designed and deployed in response to these challenges. It also includes a detailed account of the deployment, and a corresponding analysis of the results. Furthermore, the design process detailed in this chapter introduces the embryonic concept of the materiality of WhatsApp, which is further developed in the following chapter.

Chapter 4 contains the central conceptual contributions of this thesis, the model for appropriation of social media for coordinating participation (unplatformed design), and the conceptualisation of social media as *design material*. It begins with a systematic analysis of the design decisions underpinning three empirical examples of appropriation of social media technologies for coordinating participation: WhatFutures (described in previous chapter), Asynchronous Remote Communities (MacLeod et al., 2017) and Online UWC (Celina et al.,

2016). I then describe the lens of 'thinking materially' (informed by Dourish (Dourish, 2017)) which leads to the identification of conceptual similarities between these three empirical examples. These are then brought together into a presentation of the model for unplatformed design, with detailed descriptions of each of the model's elements. This chapter concludes with a discussion of the implications of this model, and its pragmatic and descriptive utility, on research and software design in general.

Chapter 5 consists of an account of the application of the model for unplatformed design in a design process for a social media-based peer support system for the Barbados Diabetes Reversal Study 2 (BDRS2). This includes a description of a multi-phase iterative design process, incorporating workshops and qualitative field work. It then details the final WhatsApp based system and accompanying resources. It concludes with a corresponding evaluation of a three-month deployment of the system, which is then used as the basis of a reflection upon the effect that unplatformed design had in the design process and upon the unique characteristics of the final design.

Chapter 6 contains details of an application of the unplatformed design model within the context of the design of social media-based language learning. In contrast to the previous chapter, here the model is used to uncover a fine-grained account of the perceptions of social media use in language learning and teaching. This comprises of two design workshops with learners and teachers, and an inductive thematic analysis of generated discussion data. This is followed by a formulation of a set of design recommendations for how social media may be incorporated successfully into language learning contexts.

In order to bring together and synthesise the findings from the previous two chapters, chapter 7 presents a closing discussion. This discussion is based upon a reflection upon its use and application within the design process for peer-support as part of BDRS2 and within designing for language learning, and is framed in respect to existing research presented within the literature review. The implications of the model are then discussed both in terms of their potential within research and design, but also on software development in general. I also

enter into a discussion around the wider opportunities and challenges presented by appropriating social media technologies for coordinating participation. Primarily I advocate for the use of unplatformed design model in design processes that seek to appropriate existing social media technologies, and point to the potential for the approach in lowering barriers to engagement, whilst offering a flexible and accessible way to design with social media technologies. I also consider ethical challenges going forward, limitations of the thesis, and identify directions for future work in this discussion.

1.7 Statement of Contributions

In answering the research questions contained within this chapter, this thesis makes four significant research contributions:

- **A conceptual contribution**, with the i) concept of *unplatformed design* and ii) a conceptualisation of social media as design material. These are ‘sensitizing’ concepts that I argue have both pragmatic and descriptive utility within design.
- **An empirical understanding**, of how social media has been appropriated in various ways, through the analysis of empirical studies found both in research contexts and in the real world. This empirical understanding forms the foundation of the conceptual contribution.
- **A methodological contribution**. With detailed descriptions of how unplatformed design can be employed in the design of systems in three wildly different contexts (future foresight, peer support, language learning), with an accompanying reflection upon these methods.
- **A design contribution** with accounts of the full design processes for two social systems: 1) a detailed description of the design development and large-scale deployment of WhatFutures: an account of how WhatsApp can be used to engage with a global population (487 participants, generating 95 individual pieces of multimedia data as well as 16,100 messages). 2) A detailed description of a design process that responds directly to the unique characteristics and cultural challenges of

a specific community in the development and deployment of a social media-based peer support system for weight loss.

Chapter 2 Literature Review

This literature review aims to lay the conceptual foundations for the thesis, and develop terms upon which to discuss the appropriation of social media technologies for the coordination of participation. This review divides this concept into three constituent themes, and draws upon HCI research and social sciences. Additionally, as this thesis includes three case studies situated in very different contexts, each case study chapter also contains a detailed and contextually relevant literature review specific to that context.

In Part 1, I introduce participation, within civic and organisational contexts, as something that is designed. The initial focus is on understanding typical approaches to designing civic participation through the development and deployment of novel technologies, along with a number of criticisms of this approach. From here I develop an understanding of online communities, and link these to the concept of *communities of practice*. I discuss ways in which online communities can be designed, and argue that many of the challenges are shared with designing participation.

In Part 2, I move from the design of bespoke technologies for participation to look at examples of where social media has been appropriated for civic participation in real world contexts. I begin by developing an understanding of the importance that social media has in shaping civic and political identities. From here I then chart studies in HCI related to the appropriation of social media in politics, health and education. I use these studies to illustrate the lack of (and need for) a consistent understanding of the appropriation of social media for participation.

In Part 3, in response to this need, I focus on HCI theories and models of appropriation. I start by looking at studies into appropriation of existing technology as it happens in the real world and develop an understanding of appropriation in this context as an example of *practice*. I then relate this to extant models of appropriation within HCI, specifically CSCW, where appropriation is conceptualised as an ongoing process of negotiation between digital artefact, users, and societal/cultural/work factors.

Finally, Part 4 summarises the key points from the previous sections, and introduces the following chapter.

2.1 Designing Digital Participation

A primary concern within HCI has been the design and development of novel technologies and processes that support civic life. Broadly referred to as digital civics (Olivier & Wright, 2015), this branch of HCI seeks to investigate new ways of reconfiguring the relationships between citizens and the mechanisms of governance, democracy, health and education. One point of commonality between these disparate domains within digital civics is the focus on collective action in identifying and addressing issues of shared concern. This is realized through the design of new digital ways for enabling discussions, sharing resources, and crucially, facilitating participation. Examples of digital civics technologies within HCI include technologies for community sector care organizations gathering feedback (Dow et al., 2016), for grassroots situated voting (Vlachokyriakos et al., 2014), for participation in civic consultation processes (Dantec, 2012), for participatory qualitative research (Rainey et al., 2019) and even for the community-commissioning of new applications (Garbett et al., 2016) to name just a few examples. These technologies have all been designed to enable participation in discussion and debate as well as participation in the collecting, interpreting and presentation of data towards the goal of demonstrating matters of community concern.

The values of the digital civics project include the prioritization of citizen voice; the widening of participation; and the creation of citizen-owned and citizen-led technologies (Olivier & Wright, 2015). Broadly speaking, all of the examples above seek to create new forms of digital participation that embody these values. Indeed, they are all underpinned by a conception of democracy that emphasizes and values plurality of voice. As such digital civics projects often seek to include those who are marginalized, 'hard-to-reach' or who are not typically recognized by the systems of civic governance. This often entails working with under-resourced community organizations (Bellini et al., 2019; Marshall et al., 2016; Dow et al., 2016), in settings of socio-economic deprivation (Marshall et al., 2016; Crivellaro et al., 2016)

without access or to or training with technological resources (Schofield et al., 2015). The design of these technologies frequently adheres to the principles of Participatory Design. Chris Le Dantec and Carl DiSalvo proposed the idea of Participatory Design within civic engagement as 'infrastructuring publics', that is as shifting the focus of Participatory Design from the design of products to the 'ongoing act of articulating and responding to dynamic attachment', in other words, the support of a dynamic organization of individuals and groups formed by the desire to address an issue. (Dantec & DiSalvo, 2013).

Although there are numerous examples of digital civics research, a landmark example of a bespoke technology developed for civic participation can be found in Le Dantec et al.'s Cycle Atlanta Project (Le Dantec et al., 2015). As part of a large urban planning project in late 2011 in Atlanta, the research team built a digital tool for supporting alternate forms of public input into the process of developing plans for new cycling infrastructure. Launched in October 2012, Cycle Atlanta used smartphone GPS to record and upload cycling routes. Each recorded route provided a record of how the cyclist navigated the city, including the purpose of the trip, notes as well as optional demographic data. The data generated in the app was used to inform publicly accessible planning meetings for new cycling infrastructure (e.g. bike lanes). Widely acknowledged as a success due to its facilitation of new forms of data-driven public participation within a civic planning process, Cycle Atlanta did face a number of interesting challenges. Although many of these revolve around the role that the data played in the planning processes (including questions of who created the data and why), the most pertinent challenges for this research are those associated with Cycle Atlanta being a bespoke application for civic participation. Interestingly, Le Dantec et al. discovered that members of the black community in Atlanta may have actively refused to engage with the Cycle Atlanta app, as they viewed it and its affiliation with the university as aligning with gentrification and thereby as a threat to their community values (Le Dantec et al., 2015). Furthermore, they acknowledge that there is a challenge of any digital democratic endeavour focused on extending participation to those who typically lack access to ICT due to existing socio-economic barriers. In respect to Cycle Atlanta, they add that there are issues around

participation where those with the means and the desire to record cycle routes are a necessarily self-selected group, and one that does *'not equitably trace the larger contours of our urban population'*.

As discussed above, widening people's engagement is a principle concern for digital civics research, especially when it seeks to include the voices marginalized communities and those who might not ordinarily engage. From Cycle Atlanta we can see that building bespoke technologies for digital participation may actually introduce more barriers to engagement. Firstly, any new technology inherently expresses the values of the designers and research team, and this may actually alienate particular communities. Secondly, the need for participants to download and learn unfamiliar software, create user accounts, or learn to use apps, is a natural barrier to engagement, compounded by issues of low-tech literacy and access to ICT resources.

Taylor et al. explored another challenge related to the design and deployment of bespoke technologies: what happens to the technology once the research ends? (Taylor et al., 2013) From an analysis of digital civics case studies, Taylor et al. identify three main challenges associated with the final stages of digital civics projects: *technology, usage* and *resources*. Firstly, they argue that technology issues arise due to the typical nature of civic technology deployments. Technologies are often prototypes rather than finished products and as they state *'research projects rarely, if ever, have the resources to create and test technologies to an extent that rivals commercial products'*. Because of this, *'when technologies are handed over to a community, they may face failure with little chance of technical support or replacement'*. Secondly, Usage issues relate to the sustainable use and generation of content for technologies. They argue that in many cases, it is actually researchers (as opposed to community members) that play the important role of seeding content or encouraging participation. Furthermore *'researchers may simply be responsible for creating enthusiasm around the project'*. The lack thereof after a project has ended may mean that a bespoke technology is simply not used. Finally, they argue that resource issues are both financial and human. *'Where research funding naturally comes to an end with the project and small*

community ventures often do not have funding available to support new technologies themselves.'

The three challenges outlined above seemingly paint a damning picture of the long-term viability of bespoke technologies for participation, at least when created as part of a typical research project. In response to these, Taylor et al. make a number of suggestions of how the 'handover' of new technologies should ideally take place to minimize these effects. These include managing the expectations of a community in respect to project end; using iterative development processes; upskilling community members; reaching mutual agreements for a planned handover; and interestingly, relieving tensions around experimental technology. The latter is particularly relevant as they state: *'Our solution has often been to utilise off-the-shelf components as much as possible, which have themselves gone through a more rigorous development process and can be more easily replaced should they suffer a failure. This also increases the availability of technical expertise in the communities. For example, participants are more likely to be able to perform maintenance on Windows PCs than Arduino boards.'*

Taylor et al.'s work is clearly oriented towards tackling the challenges of community adoption of bespoke technologies head-on. Within the context of HCI, sustainability has been a key issue for over a decade (DiSalvo et al., 2010), however the consistent problem of 'who is responsible for the technology after the research has ended' is still very much a real one. These issues are only compounded when working in resource poor and expertise poor contexts. Bespoke digital participation technologies require time, money and expertise to produce. Research teams are happy to take on this burden (often as part of a co-design or participatory design process with stakeholders), acting as 'capacity' for a collaborating organization or community in exchange for the ability to do research with real communities. However, as Taylor et al. state, research teams are frequently small in number (compared to commercial software teams), with limited resources. Furthermore, these teams are often under pressure from funding deadlines and are frequently focused on publications rather than on producing reliable technology. This means that technologies often do not benefit from extensive user testing, multiple stages of iterative design, or time spent ensuring

features are robust, presentable and understandable. In essence, digital civics research teams do not operate in conditions that are conducive to the creation of great technology. This further worsens the sustainability of technologies, as software that is created quickly and/or cheaply is more likely to malfunction and more likely to be inaccessible to people outside of the development team to modify, adapt and learn. Furthermore, it is less likely to be aesthetically acceptable. This last point is particularly relevant when technology is used with real people for addressing real needs (as is the case in most digital civics research) as the way a piece of software looks affects how it is perceived, and therefore also how (and if) people engage with it.

Although Taylor et al. make towards addressing these concerns (Taylor et al., 2013), the reality is that many of these new technologies are functionally dependent on the research team who developed them, undermining the value of being truly citizen-led or citizen-owned. However, one solution (and the solution explored in this thesis) is to not create bespoke technologies in the first place. Instead, to design systems of participation through the appropriation of robust existing technologies already adopted and understood by those communities.

In summary, digital civics research within HCI has explored new ways of designing digital participation. In particular, it has investigated ways in which novel technologies can reconfigure the relationships between citizens and the mechanisms of governance democracy, health and education. However, the emphasis on the building of new technologies presents a number of issues in terms of sustainability, capacity and barriers to engagement. This points to the value of using platforms that participants are already using and of 'going where people already are' rather than trying to attract them to new technologies that may not offer the robustness, usability or acceptability of commercially available products.

2.1.1 Online Communities

Online communities have existed as long as there has been the internet, most significantly with the development of bulletin boards, mailing lists and Internet Relay Chat, facilitating online communication between people. Howard Rheingold (Rheingold, 1993) coined the term virtual communities, defining them as *'social aggregations that emerge from the Net when enough people carry on those public discussions long enough, with sufficient human feeling, to form webs of personal relationships in cyberspace'*. More recently, social media technologies such as Facebook, Twitter, and WhatsApp facilitate the creation of large online social networks consisting of multiple online communities.

As early as 1998, Lazar et al. proposed a classification of online communities (Lazar & Preece, J., 1998) that focused on defining attributes of those communities. They identified four different schemas by which communities may be categorized: by attribute (e.g. a shared goal), by supporting software, by relationship to physical communities, and by boundedness (e.g. group cohesion). These descriptive schemas are a useful, if primitive, ways of describing the qualities of online communities, at least in terms of the early internet. However, the advent of social media has necessitated a much broader and inclusive definition of online community. Preece et al. in the introduction to a special thematic section of the Journal of Computer-Mediated Communication (Preece & Maloney-Krichmar, 2005) state that: *'Community has become the "in-term" for almost any group of people who use Internet technologies to communicate with each other. Depending on whether one takes a social perspective or a technology perspective, online communities tend to be named by the activity and people they serve or the technology that supports them'*.

Whilst the study of online communities is not the focus of this thesis, a coherent concept of community is intrinsically important to the case studies detailed within it, as they attempt to design new digital ways of bringing individuals together for the purposes of participation, in essence creating new online communities. The term 'community' has been defined and redefined within multiple research disciplines and remains a contested term. However, the

concept of communities of practice (Wenger, 1998), with its focus on peer-to-peer interaction, shared goal orientation and resource sharing between community members provides a useful lens with which to view and understand the design of online communities.

2.1.2 Communities of Practice

Etienne Wenger introduced the term 'communities of practice' (Wenger, 1998) to describe the way in which a group of individuals that engage in the process of sharing resources, knowledge and skills around a common concern or passion for something they do, learn how to do it better as they interact regularly. Unlike traditional notions of community (e.g. a neighborhood community) where individuals may have completely opposite concerns and interests despite living in the geographic area, communities of practice are united primarily through shared concern. This makes it an especially useful concept for understanding online communities where geography or situatedness is generally less relevant. Wenger defines three crucial elements to communities of practice: *domain*, *community*, and *practice*. Domain is defined as the central shared domain of interest for the community. Membership of that community *'therefore implies a commitment to the domain, and therefore a shared competence that distinguishes members from other people'*. Importantly, domain is not necessarily something recognized as "expertise" or important outside of that community. Community refers to the group of individuals who, in pursuing their interest in their domain, *'engage in joint activities and discussions, help each other, and share information. They build relationships that enable them to learn from each other; they care about their standing with each other'*. A crucial factor in this is the need for interaction to occur between individuals. Lastly, practice refers to a *'shared repertoire of resources: experiences, stories, tools, ways of addressing recurring problems'*. In short, the knowledge and resources built up by the community in their shared interactions. According to Wenger *'It is the combination of these three elements that constitutes a community of practice. And it is by developing these three elements in parallel that one cultivates such a community.'*

Although the theory of communities of practice has been very influential, particularly in business and organizational management, more specificity is needed when translating these relatively broad concepts into useful guidance for the design of online communities. Even more so when we consider the design of online communities on social media technologies, in specific domains and context. Nevertheless, communities of practice theory provides a high level lens through which to pursue such an enquiry, as is the case in this thesis.

2.1.3 Designing Online Communities

One early attempt to provide practical guidance on the design of online communities can be found in Jenny Preece's book 'Online Communities: Designing Usability, Supporting Sociability' (Preece, 2000). More influenced by Rheingold's work on virtual communities (Rheingold, 1993) than Wenger's communities of practice, Preece describes ways that designers can 'design usability' and 'plan sociability' in how they design systems and websites. Published in 2000, Preece's book understandably bases its concept of online communities on the message boards, internet forums and chat rooms of the early internet. Preece states that after assessing the needs of a community you are designing for, you should focus your attention on developing interaction dialogs, navigation, registration forms, representations of users etc. to ensure that the community can use the tool you are designing for their needs. Preece also highlights the importance of creating an environment that fosters sociability, through the implementation of policies for membership, codes of conduct, security and moderation etc. Many of the insights provided within the book are common place standards for contemporary social networks, even though these networks have far surpassed the complexity and sophistication of early internet message boards. Of particular relevance is Preece's appreciation of different roles within an online community (described as moderators, mediators, professionals and lurkers) and the importance of designing for each through the design and implementation of community policies. Preece's early work is useful for understanding the 'bare essentials' of designing an online community, but does not go past usability and first wave HCI concerns (Harrison et al., 2007) as it has a focus on optimizing

the fit between online community software and users, as opposed to supporting situated action within the world (e.g. coordinated participation).

Kraut and Resnick's 'Building Successful Online Communities' (Kraut & Resnick, 2018) is a more recent and more nuanced book about the design of online communities. In it, they rely heavily on social sciences (including Wenger), economics and psychology to identify five categories of critical challenge for the building of successful online communities: encouraging contribution, encouraging commitment, regulating behavior, attracting and socializing new members, and starting new communities. Within each of these categories they make a series of evidenced design claims around particular aspects of an online community. These design claims follow a positivist scientific paradigm, seeking to relate tangible design alternatives (e.g. providing small rewards to community members for completing tasks) into helping or hindering a design goal (e.g. motivating increased contributions from members). By focusing on the social and psychosocial elements of online communities (as opposed to the implementation of features and questions of usability), Kraut and Resnick's design claims can be easily mapped onto any online community. Although their primary intention is to inform the design of new social networking sites, their insights could equally be applied to offline communities and to communities on existing social media technologies. In respect to coordinating participation, many of the related challenges also fall under the categories identified above. In particular, encouraging contribution and attracting new members. Kraut and Resnick do not specifically engage with coordinating participation, though their social and psychosocial approach to designing online communities offers a starting point to tackling some of the shared challenges.

2.1.4 Summary

Wenger's concept of communities of practice (Wenger, 1998) provides a useful high-level framework for understanding online communities in respect to coordinating participation. Specifically, it highlights the importance of understanding the relationship between the domain, community and practice of a coordinated participation, or in other words, the overall

goal of the participation, those who take part in it, and the way in which they do it. Research into the design and building of online communities allows us to translate these high-level concepts into the actual design of technologies. Moving from first-wave HCI concerns of usability and efficiency (Preece (Preece, 2000)) towards a social sciences informed understanding of communities (Kraut & Resnick, 2018), provides a way of designing online community through identifying a common set of ‘design challenges’ that are technology agnostic. These can also be used to highlight those aspects of technologies that can help or hinder certain types of behaviors.

2.2 Social Media and Participation

Much has been written about the effect social media has in shaping every aspect of our civic lives (Highfield, 2017; Loader et al., 2014; Mihailidis, 2014; Shah et al., 2001). Particularly in respect to how traditional forms of civic engagement and participation have evolved or been translated onto social media technologies. Key to this transformation is the ‘everydayness’ of social media. Tim Highfield in his book ‘Social Media and Everyday Politics’ (Highfield, 2017) argues that social media affords *‘the opportunity for different groups, including citizens, traditional political actors, and journalists to contribute to, discuss, challenge and participate in diverse aspects of politics in a public, shared, context.’* He argues that although social media may not increase formal political participation (e.g. voter turnout), they are still critical for how people understand and express their relationship with the political, with society and with the everyday. Highfield argues that it is through the mundanity and ubiquity of personal expression through social media (e.g. memes, selfies etc) that people shape and frame their political and civic identities. For example, Mahoney et al. looked at Instagram use during the Scottish Referendum and discovered a rich practice of photo-sharing used to craft and present a political ‘self’ (Mahoney et al., 2016). They cite the ‘power of imagery’ within the context of political debate and how people use existing images and power relationships to promote and reinforce political messages and political identities. Importantly they note that these political identities are constructed in the same way as everyday online personas. This is particularly the case with young people, as shown by Loader et al. (Loader et al., 2014) who

state that: *'The political identity and attitudes of young citizens are thereby seen to be increasingly shaped less by their social ties to family, neighbourhood, school or work, but rather by the manner in which they participate and interact through the social networks which they themselves have had a significant part in constructing'*. They introduce the concept of 'the networked young citizen', as being a member of a new transformative type of civics that eschews typical mainstream politics in favour of political self-expression, consumer boycotts, rallies and social movements, that are primarily characterised by social media and networking practice. Indeed, In 2010/11 Paul Mihailidis performed an extensive survey of approximately 800 college/university age students, and focus groups, in the US to ascertain the role social media played in their personal and civic lives. The results of this survey show that young people increasingly use social media spaces for all their information and communication needs, but that they primarily conceptualize these platforms as social outlets. Mihailidis argues that this disconnect recommends further inquiry into how social media can be positioned as an inclusive tool for engagement in daily life, however as expressed by Loader et al. it may be that social media is actually blurring the boundaries of social and civic engagement for young people.

Another useful idea in understanding the relationship between social media and participation is the concept of context collapse. Popularised by Danah Boyd, context collapse refers to a unique challenge of posting on social media, where instead of having a very clear idea who your audience is (as you would in a real life conversation with someone), instead people are presented with an infinite number of 'imagined' audiences. This makes it difficult for people to use the same techniques that they would use in real life (e.g. changing tone, content etc.) to suit an audience (Marwick & Boyd, 2011). Context collapse necessitates users of social media to create new techniques through which to express themselves publicly (Baym & Boyd, 2012). This naturally has an implication on any social media project that seeks to engage people in civic participation. Such engagement must be predicated on an understanding of the unique complexities of having to present a verifiable, singular identity on social media where participants must contend with groups of people they do not normally bring together,

such as acquaintances, friends, co-workers, and family. According to Marwick et al.: *“To navigate these tensions, social network site users adopt a variety of tactics, such as using multiple accounts, pseudonyms, and nicknames ... The large audiences for sites like Facebook or MySpace may create a lowest-common denominator effect, as individuals only post things they believe their broadest group of acquaintances will find non-offensive.”*(Marwick & Boyd, 2011). Any participatory project on social media will inevitably be affected by this, particularly those that encourage or require self-expression from participants.

Clearly, the definition of ‘civic participation’ has undergone (and continues to undergo) a dramatic shift from traditional modes of participation to one that is more relational and heavily influenced through our connections and activities on social media technologies. Although this shift provides more justification for taking social media technologies and participation seriously as a focus of enquiry, this thesis is primarily concerned with the ways in which participation can be actively designed through social media technologies, as opposed to happening organically through the everyday. Of course, an understanding of how the concept of participation has evolved through social media is important, particularly in respect to identifying the features and affordances of social media that have contributed to this evolution. However, it is the actualisation of explicit mechanisms of participation that is the primary focus of this research. As such, we will now look at ways in which social media technologies have been deliberately appropriated to facilitate participation within different domains of civic life.

2.2.1 Social Media Appropriation for Politics

One of the most prominent examples of the active use of social media technologies for facilitating political participation is their use in the Arab Spring. Howard et al. (Howard et al., 2015) in their analysis of the Egyptian revolutions of 2011 identified the active use of social media (particularly Twitter, Facebook and YouTube) in giving voice to campaigners, centralizing debate, and organising and gathering supporters. As well as for coordinating protests, Howard et al. highlight the deliberate use of YouTube and other video archiving

centres for the broadcasting of stories that the mainstream media could not or did not want to cover.

The deliberate use of social media technologies to coordinate and forment political activity is not restricted to revolutions. For example, Crivellaro et al. (Crivellaro et al., 2014) examined the ways in which Facebook was used by a local activist group concerned with the redevelopment of a derelict outdoor swimming pool, identifying how the *'appropriation of Facebook technology is intertwined with the creation of a social movement and its mobilization in socio-political action'*. This is but one of many examples of the deliberate appropriation of a social media technology for active participation in political action, across a wide range of political activities and matters of concern. Rotman et al. (Rotman et al., 2011) argue that social media technologies have *'introduced the opportunity for wide-scale, online social participation'*, and heralded a new form of low-effort political participation known as *'slacktivism'*. Examples of slacktivism include changing the colour of your social media avatar icon to show solidarity to a particular cause, or the signing and forwarding of online petitions and political material. Whether slacktivism is successful or not in enacting political change is still under debate (McCafferty, 2011; Rotman et al., 2011; Lee & Hsieh, 2013; Cabrera et al., 2017), but what is clear is that even features not intended for civic participation (e.g. a user's profile picture) can be creatively appropriated as a visible act of participation.

These examples of social media activism and political action are all citizen-led, and *'bottom up'* in orientation. However, social media technologies have also been appropriated into *'top down'*, institution led approach to political participation. In particular WhatsApp, which Cruz et al. argue is a *'technology of life'* (Cruz & Harindranath, 2020) in that it *'infrastructures wide range of quotidian activities, from personal to economic, from spiritual to political'*, has been widely appropriated into civic mechanisms within the developing world. For example, WhatsApp is often used for delivering court summons in India (Ohri, 2018) as its digital infrastructure is seen as more reliable than traditional postal services. In this instance, the *'blue ticks'* that appear on a WhatsApp message when it has been received and read have been ruled as sufficient as a receipt for the justice system. In a clever twist, disabling these

read receipts allows an accused to avoid this digital summons. WhatsApp has also been used to monitor election fairness in South Africa (Ofusori & Kariuki, 2017), where it was used to facilitate faster relaying of electoral information from the various voting stations to the central results centre. Additional reported benefits of appropriating WhatsApp in this capacity were that it was user-friendly to use, strengthened inter-personal relationships, and importantly, was very affordable in a low resource context.

However, research has also identified that in some cases the role of social media within political participation has been overstated, or has even been detrimental. For example, Smidi et al. in a survey of studies around the Arab spring found that many argue that social media played only a limited secondary role in the revolutions, alongside social, political, economic and historical factors (Smidi & Shahin, 2017). Furthermore, a weight of literature in recent years has looked at how social media (primarily Facebook) has actually damaged democracies across the world, through facilitating the spread of misinformation (Farkas & Schou, 2019), the creation of echo-chambers, and the decay of political discourse (Sunstein, 2017). Clearly the unique affordances of social media that have enabled such things to take place. How can social media simultaneously give rise to hopes for liberation in authoritarian regimes, be used for repression by these same regimes, and be harnessed by antisystem actors in democracy? According to Tucker et al. there are 2 reasons: *“1) that social media give[s] voice to those previously excluded from political discussion by traditional media, and 2) that although social media democratize access to information, the platforms themselves are neither inherently democratic nor nondemocratic, but represent a tool political actors can use for a variety of goals, including, paradoxically, illiberal goals”* (Tucker et al., 2017). This last point is particularly interesting as it points to both the power of social media (as a communication tool for political participation), and therefore also to the importance of thinking seriously about how this tool can be employed within participation.

In summary, it is clear that the affordances of social media, combined with social media's ubiquity and pervasiveness, uniquely suit it to infrastructuring political participation, and that this can be both powerfully democratic or dangerously anti-democratic depending on how it

is used. The wide scope and varied orientations of political participation with social media points to the existence of a wide, and relatively uncharted design space, and highlights the importance of critically engaging with the affordances of social media.

2.2.2 Social Media Appropriation for Health

Many approaches to using social media for health have tended to view social media as another avenue for providing health information. In a systematic review into the potential for social media for health (Moorhead et al., 2013). Moorhead et al. identify a number of potential benefits including increased interactions with others; more available, shared, and tailored information; increased accessibility and widening access to health information; peer/social/emotional support; public health surveillance; and potential to influence health policy. The public health model of ensuring that people can access correct reliable information about their health is seen as a priority for its use within health, with quality concerns and lack of reliability, confidentiality, and privacy seen as the major drawbacks.

Increasingly peer support for health conditions (e.g. chronic diseases (Cotter et al., 2014; Gavrilu et al., 2019)) is taking place on social media. Social media technologies are identified as offering an opportunity for low-cost and accessible peer-support, particularly important in resource constrained and/or developing contexts (Rotheram-Borus et al., 2012), and are widely acknowledged as presenting significant opportunities for peer support (Cotter et al., 2014; Naslund et al., 2016). However, studies into social media-based peer support have largely conceptualized it as a naturally emergent phenomenon (Naslund et al., 2014) rather than as something that can actually be designed.

Although general social media use has been consistently linked with negatively affecting mental health of young adults (e.g. (Berryman et al., 2018; Barry et al., 2017)), the deliberate use of social media based support groups has conversely been cited as offering great potential for improving mental health. For example, O'Leary et al. (O'Leary et al., 2017) through interviews with young people experiencing mental health advocate the untapped potential for social media for supporting mental health through matching peers on similarities beyond

diagnosis; enhancing accessibility to support; and proactively mitigating risk through training and intervention. Similarly Vacca (Vacca, 2017) identified the importance of ‘co-opting’ existing social media technologies when designing technology for emotionally supporting teenage Latinas in the US. Through a co-design process, Vacca suggests the creation of plugins and extensions for popular applications should be a focus for interactions that seek to engage young people, and identifies the casual affordances and familiarity of instant messaging services as crucial to engaging young people.

Within the context of health research, MacLeod et al. (MacLeod et al., 2017) developed the Asynchronous Remote Communities (ARC) method. Used for engaging distributed ‘harder-to-reach’ populations using social media, the ARC method relies on a series of designed workshop activities that participants complete within a Facebook group. The ARC method has been successfully used to engage new mothers (Prabhakar et al., 2017), people with rare diseases (MacLeod et al., 2015) and people living with HIV (Maestre et al., 2018). Through successive studies MacLeod et al. have identified a number of lessons for using existing platforms to design engagements with distributed populations, and also point to limitations specific to Facebook. As a primary example of the appropriation of social media technologies for the facilitation of participatory health research, ARC is discussed extensively in chapter 4 of this thesis.

In summary, social media within health has been most effectively used in the facilitation of peer-to-peer participation, such as in peer support processes for mental health, or in support groups for chronic diseases, and has had limited successes as a mechanism for public health information distribution. This again highlights the unique strength of social media as consisting in its capacity for the creation and sustaining of a network of individuals, with a set of shared community resources, and goals. In other words, the forming and maintenance of a community of practice.

2.2.3 Social Media Appropriation for Education

The pedagogical potential of social media has been widely reported for at least a decade, most prominently within higher education contexts. A 2011 report by Pearson (Moran et al., 2011) reported wide spread faculty use of social media claiming *'over 90% of all faculty are using social media in courses they're teaching or for their professional careers outside the classroom'*. Social media has been heralded as potentially wildly transformative within education where it has been heralded as *'reconceptualising the boundaries between formal and informal learning'* (Greenhow & Lewin, 2016). Despite its wide spread use, this blurring and renegotiation of boundaries of education is creating design challenges, both in terms of how social media is successfully appropriated within education, but also how pedagogies adapt to social media. Writing for The Europa World of Learning, Neil Selwyn eloquently summarises this: *'perhaps the most pressing challenge for the higher education community at present is to engage in considered and realistic debates over how best to utilize social media in appropriate ways... Of course, clear lines need to be drawn between the immediate practical tasks of developing forms of social media use that better fit within the current 'grammar' of formal higher education systems, and addressing the rather more difficult longer-term issues of system-wide reform and redesign'* (Selwyn, 2012).

From this we can see that the use of social media within education sits within the heart of a very interesting design space. Responding directly to the challenge above, some attempts at appropriation have framed social media as a *'learning environment'*. For example, Dabbagh et al. (Dabbagh & Kitsantas, 2012) propose the concept of *'personal learning environments'* (PLEs) as a way of both integrating formal and informal learning using social media and supporting student self-regulated learning in higher education contexts. In order to provide some useful direction as to how to design PLEs into pedagogies, they offer a three-step framework that moves from encouraging students to use social media such as blogs and wikis; to using social media to engage in basic sharing and collaborative activities; to using social media to synthesize and aggregate information in order to reflect on their overall learning experience. This framework is useful in shaping the design of learning activities, but remains

relatively generic and high-level, it does not for example consider the differences between social media technologies in how these three steps can be enacted. The use of social media to bridge formal with informal learning can also be seen in language learning research, where social media has been identified as complementing classroom methods in terms of delivering complex socio-pragmatic knowledge through spontaneous interaction with people of different age and social status (Toetenel, 2014; Manca & Ranieri, 2016; Greenhow & Askari, 2017).

Examples of social media appropriation outside of formal learning can be found in their use in Massively Open Online Courses. In particular, Celina et al. (Celina et al., 2016) designed a series of connectivist open online courses in collaboration with United World Colleges (UWC). These courses used existing social media technologies as central infrastructure for learning activities, in support of their autonomy as learners and lowering technological barriers to participation. Infrastructuring the courses in this way was found to increase overall engagement, particularly in respect to promoting community. However, Celina et al. noted the challenges of providing clear and unambiguous communication to participants about logistics and learning expectations when no central platform was used and particularly when working at scale across multiple platforms. As a primary example of the appropriation of social media technologies for the facilitation of participatory education, Online UWC is discussed extensively in chapter 4 of this thesis.

2.2.4 Summary

The deliberate appropriation of social media technologies is transforming every aspect of civic participation. It is reconfiguring citizens relationship with the political, their political identities and the ways in which they participate in politics, society and with decision making within governance. We can see this both from dramatic examples of revolution within Egypt, but also the formation and development of small-scale local activist groups on social media technologies, as well the emergence of acts of small political participation expressed through the affordances of social media technologies, e.g. slacktivism. Similarly, the mechanisms of

governance are moving to appropriate social media - 'technology of life' – as digital infrastructure of civic participation and engagement. The same influence can be seen within health, as medical institutions appropriate social media for everything from appointment booking, to symptom tracking, to public health information. The most successful appropriation within health however has been where the natural strengths of social media (e.g. the ability to network and connect people) has been used for the infrastructuring of peer-to-peer support groups. Outside of higher education, social media has yet to gain much traction in formal learning despite (or perhaps because) being broadly seen as transformative to pedagogies. However, within informal learning, particularly MOOCs, social media technologies have been successfully appropriated to infrastructure courses that emphasise social connections, and 21st century skills.

Although the utility of the appropriation of social media technologies for coordinating participation is demonstrated relatively unambiguously in the literature presented in the section, a number of challenges are also identified. Firstly, the identification of such a wide and varied design space presents an immediate challenge of how to properly explore, communicate about and engage with the design space in a consistent and productive way. This calls for the creation of conceptual 'tools' (e.g. design lenses, frameworks, models) with which to navigate it. Establishing and verifying a clear terminology and/or design model will help with 'charting' this space, and will help for example in determining the different design considerations between appropriating social media for a 'bottom-up' social movement than for a 'top-down' mechanism of state.

Secondly, much of the literature which looks at the viability of social media within various contexts (e.g. is social media good for health? Or education?) takes a relatively coarse-grained understanding of social media. Not enough attention is paid to how social media technologies differ in terms of features, affordances and social perception, and what affect these may have in their appropriation. For example, different social media technologies offer very different features and services (e.g. text, audio, video messaging, and calls). Furthermore different social media technologies are associated with different functions (e.g. work, play, socialising)

and different sets of interpersonal relationships (e.g. professional, familial, peers) (Nouwens et al., 2017) which, again, will affect the outcome of attempting to appropriate social media for specific uses.

Lastly, consequent from the two previous points, there is a challenge for how we combine a consistent conceptual model of the design space, with a more fine-grained understanding of social media technologies, to give guidance on how to appropriate these technologies towards specific participation contexts. In other words, how we map our understanding productively onto real world problems. To help answer this question, I now look at HCI research into the appropriation of technology, with a particular emphasis on the relationship between appropriation and design of technologies.

2.3 Appropriation and Design

HCI has a long history of research into the appropriation of technology (Stevens et al., 2009; Muller et al., 2016; Dix, 2007; Belin & Prié, 2012; Dourish, 2003). Broadly speaking this research is split into two overlapping and mutually dependent concerns: 1) Identifying how appropriation of technology occurs in real world practice e.g. (Derboven et al., 2017; Wiggins, 2013); and 2) Identifying what aspects of technologies contribute to or hinder successful appropriation, and why e.g. (Dix, 2007; Tchounikine, 2017). Naturally an understanding of the first informs the second, and vice versa. This section of literature review examines these two concerns in turn in order to illustrate the relationship between design of technology and appropriation, in both in theory and in practice. Note that the research studies in this section have a very different focus to the studies described in the previous section. In the previous section, examples of appropriation of social media explored questions of motivation (e.g. ‘why’ social media was appropriated), and context (e.g. to ‘what’ purpose). In this section discussed research instead ask ‘how’ technologies have been appropriated.

2.3.1 Research into Appropriation of Social Media as Practice

One area of research that has emerged from the specific concern of how social media is appropriated as practice, is the field of crisis informatics. Since 2001, considerable work has

been undertaken in understanding the utility of social media in communicating critical information during and after a crisis. Of particular relevance, Starbird and Palen (Starbird & Palen, 2011) conducted a study of the self-organisation of volunteers during the 2010 Haiti earthquake, noting how systematic use of hashtags and micro-syntax (called 'tweak the tweet' or TtT) led Twitter (as well as a collection of other social media technologies) to be more effectively used to coordinate digital volunteerism. Talking about syntax:

“TtT added structure to tweet information; even when the syntax wasn't used in full, it helped voluntweeters to remember to include—and teach others to include—the necessary pieces of information into a single tweet to make it complete. There was also indication that some saw the syntax as imparting a kind of authority because of its perceived rigor and assumptions about attention to accuracy by those using it” (Starbird & Palen, 2011) p1079

This is a powerful example of how a community of practice (Wenger, 1998) can emerge and be sustained through specific appropriation of certain features of social media, in this case hashtags and syntax. Similarly Cobb et al. (Cobb et al., 2014) studied social media use during crisis events, and identified ad hoc collaborative practices employed by digital volunteers that helped with handling the 'deluge' of digital information. Consequently, they proposed a series of design recommendations for tools that could be used to support these communities of practice whilst still maintaining the crucial flexibility of social media use. Research in crisis informatics points to the value of systematic and considered use of social media technologies for effective coordination of participation in volunteerism.

Digital civics is an area of HCI that generally operates in a non-commercial and values driven research space where the appropriation of existing technology is often motivated for both pragmatic and democratic reasons. How social media technologies have been appropriated for public engagement is one such area. To investigate this, Hou and Lampe (Hou & Lampe, 2015) conducted a survey of 26 non-profit organisations and how they appropriate social media for engagement. They identified the specific uses of social media technologies in public engagement work, such as for increasing awareness of information, building community and

mobilizing for action. Also identified were a series of limiting factors, such as demands on time and requirements of expertise for successful appropriation, as well as issues related to funding and organisational politics. They proposed a set of design considerations to overcome these limitations. These design considerations looked to augment the existing features of social media to with external management and analytics tools, in order to make the technology more suited to the needs of non-profit organisations that are conducting engagement projects. Research into citizen led appropriation social media technologies has frequently focused on ad hoc appropriation practices. For example, Volda et al. (Volda et al., 2011) describe how volunteer coordinators at non-profit organizations use a mix of homebrew databases and associated information management tools that is born out of necessity. They identify the shortcomings of 'cobbling together' free software, such as insufficient features, clumsy interfaces and general integration failures. These findings are also reinforced by Wiggins (Wiggins, 2013) who reports how resource-constrained citizen science projects similarly struggle with freely available software. These findings highlight how the purposeful and systematic appropriation of existing social media technologies may offer a compelling set of design opportunities, as opposed to ad hoc and make shift practices.

Instant messaging technologies have also received extensive attention in how they are adopted and used in the workplace, see (Handel & Herbsleb, 2002; Hinds & Kiesler, 2011; Isaacs et al., 2002) for examples of empirical studies of real use examples of chat and messaging applications in workplaces. The field of communicative ecology (Hearn & Foth, 2007) seeks to understand how groups utilise multiple tools, physical and digital, to communicate. For example Dittrich et al (Dittrich & Giuffrida, 2011) highlight the importance of instant messaging tools for communication between software developers. Turner et al (Turner et al., 2010) investigated the factors behind the adoption of communication tools by employees of a small corporation, they then used these to identify four main categories of factors *Function, Immediacy, Productiveness-Efficiency* and *Social Aspects*, and related these to the affordances of these technologies. Gonzales et al (Gonzales et al., 2015) explored how teams in an international scavenger hunt appropriated an eco-system of tools to work

collaboratively to quickly complete multiple creative challenges. They established that successful appropriation hinged on similar factors identified by Lentz et al (Lentz & Bleizeffer, 2007) within complex IT environments, in that successful tools remained flexible to dynamic changes within teams.

2.3.2 Designing for Appropriation

Naturally, a better understanding of what factors lead certain technologies to be appropriated over others, leads to a better understanding of how to design technologies in a way that encourages appropriation. The research described in this section attempts to formalise this knowledge into models and frameworks for understanding appropriation. This has been an area of interest with HCI and CSCW for a number of years. Alan Dix (Dix, 2007) identified a set of heuristics to support designers who wish to create software in ways that makes appropriation by end users easier and more likely. These include *allow interpretation, provide visibility, expose intentions, support not control, pluggability and configuration, encourage sharing and learn from appropriation*. The last heuristic, to learn from the ways that technology has already been appropriated, is particularly relevant as it bridges the connection between appropriation as it naturally occurs, and with design. Dix describes this as looking closely at what aspects of an appropriated technology may be incorporated into a new tool. In terms of social media technologies, we might extend this idea to ask what we can learn from the practice of appropriation *itself*. That is, we might look at ways of designing coordinated participation informed by practices of the appropriation of existing technologies, rather than designing new or bespoke technologies to achieve the same aim.

More recent work has moved from general heuristics for design, towards more holistic accounts of the relationship between user, practice and technology in understanding appropriation. According to Paul Dourish:

“Appropriation is the way in which technologies are adopted, adapted and incorporated into working practice. This might involve customisation in the traditional sense (that is, the explicit reconfiguration of the technology in order to suit local needs), but it might also simply involve making use of

the technology for purposes beyond those for which it was originally designed, or to serve new ends.” (Dourish, 2003) p467

Specifically focussing on the technical elements of software, and how it directly affects its suitability to appropriation by users, Dourish identifies 3 broad principles to inform software design: supporting the interoperation between multiple perspectives or organisations for the same information; making action and the consequences of action visible in an interface; and making control over information a matter for the application rather than the infrastructure. Dourish argues that an understanding of the technical aspects, as well as social conditions, is crucial for an understanding of system appropriation.

Pierre Tchounikine (Tchounikine, 2017) also takes a holistic perspective on appropriation, but also includes the effect of societal factors within a theoretical understanding. Tchounikine provides theoretical guidelines to be incorporated into design cycles where designers seek to understand social, technical and task-specific factors in order to inform and improve the development of digital artefacts.

“Appropriation of software is related to the way users, while interacting with the tasks they consider, attribute functional values to software artifacts and, by considering them as mediators of their activities, turn them into instruments for themselves. This process is influenced by preexisting psychological and social constructions and their evolution, including aspects related to work practices.” (Tchounikine, 2017) p178

Tchounikine offers 5 principles for the design of technologies that situate ‘designing for adaptation’ as an explicit concern in design cycles, and considers both understanding the functional value attributed to software by a user, and also the provision of means with which to customize and adapt at both macro (community) and micro (user) levels. Relating this to social media specifically we can see how the functional value placed by an organisation on a social media technology (e.g. a non-profit organisation valuing twitter as a way of increasing engagement reach), must also be matched by the capabilities of that technology in enacting that function. This frames appropriation as an ongoing process of design, informed by software developer, user and social, cultural and work practices.

2.3.3 Summary

The first part of this section outlined research efforts into understanding how social media technologies have been appropriated in the real world. Furthermore it framed this appropriation as examples of practice, within the context of a community of practice built around social media technologies. These studies into existing appropriation practices have also highlighted a number of issues. Firstly, the role that external management and analytic tools and services may play in augmenting and supporting the use of social media towards coordinating participation. Secondly, that ad hoc appropriation practices are often woefully under equipped to deal with real-world contexts, pointing to how the creation of purposeful and systematic understanding of appropriation may offer a compelling set of design opportunities. Lastly, that maintaining flexibility and sociability is key to successfully appropriating social media.

The second part of this literature review section outlined a number of theories of the role of appropriation within the design of software. Although not specifically about social media, these theories underline the importance of learning from real world practice, whilst also remaining sensitive to how technology can be designing to support customization, adaptation and appropriation in general.

This thesis looks to contribute to the existing work discussed in this section by bringing together both an understanding of the practical realities of appropriating social media (as informed by empirical studies) and the theoretical approach of Dourish and Tchounikine in terms of reconceptualising social media technologies specifically.

2.4 Literature Review Summary

This literature review has focussed on research surrounding the design of participation through digital technologies. I started with a discussion of digital civics, a research project that seeks to reconfigure the relationships between citizen and civic life through the development of technology, and that is emblematic of this type of research. Through discussion of digital civics approaches I have illustrated the role that technology can play in creating new avenues

and modes of participation. In addition to digital civics research, this review has also looked at online communities as a form of designed participation that shares many of the same design challenges. This further reinforces the need for participation and engagement to be designed in a way that is responsive to a community's needs. The concept of communities of practice was introduced as a useful way of understanding this, in relation to a community's shared goals and collaborative resources. However, my discussion of digital civics approaches, in particular the creation of novel and/or bespoke technologies, raises a number of criticisms around issues of sustainability, engagement and capacity.

In response to these criticisms I then introduced literature that looks at the appropriation of existing social media technologies (as opposed to the creation of new ones) within the context of civic participation. I put forward the view that the use of widely adopted social media platforms actually overcomes these issues of sustainability, engagement and capacity, whilst at the same time being more in line with the ways in which citizens increasingly develop and maintain their civic and political identities. Through a presentation of examples of social media appropriation within politics, health and education, I charted current practices. However, this exploration also highlighted the lack of a consistent understanding of the appropriation of social media for participation as an approach for designing and coordinating participation. Although the utility of appropriating social media for coordinating participation is clear, there remains to be a clear articulation of this approach from a design perspective.

In response to this need, I then introduced HCI research into the appropriation of technology. I started by looking at research into how appropriation of social media (and other) technologies occurs in the real world and responding to real world needs. Echoing findings from the previous section, although social media is being extensively and successfully appropriated within a number of domains and contexts, ad hoc practices and 'cobbling things together' often reduce effectiveness and create additional work. This clearly indicates the need for a more coherent and systematic understanding of appropriation as it can be enacted through design of participation. To support this, I then related these findings to existing

models of appropriation within HCI, specifically CSCW, where appropriation is conceptualised as an ongoing process of negotiation between digital artefact, users, and societal/cultural/work factors. Although these models do not deal specifically with social media, and are relatively high level (making them harder to action into use within practice), they nevertheless usefully point to 'what is important' within appropriation in a general sense. This can act as a useful foundation for the formulation of a model for the appropriation of social media going forward.

The following chapter of this thesis contains a reflective account of a design process of a digital engagement, through the appropriation of an existing social media technology. It details the use of WhatsApp to design a large-scale participatory foresight activity within a humanitarian context. It is an attempt to directly respond to the design challenges outlined in this literature review associated with the design of bespoke technologies (e.g. sustainability, engagement, capacity). Furthermore, through a reflection on the design process, the following chapter also marks the early formation of a framework for the appropriation of social media for coordinating participation, albeit in embryonic form.

Chapter 3 WhatFutures: Designing Large-Scale Engagements on WhatsApp

In this chapter I introduce *WhatFutures*, a large-scale engagement that used existing social media technology to facilitate participatory future forecasting. A version of this chapter was published in *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*³. I was responsible for the concept, design and deployment of the study as well as data collection, statistical analysis and writing of the entire paper. Ahmed Kharrufa and Patrick Olivier provided feedback on drafts; Robert Anderson and Tom Nappey assisted in generating visual design assets and technical infrastructure; Shaun Hazeldine, Carlos Alvarez and John A. Sweeney were collaborators who gave feedback on the design of the study; and Andrew Garbett and Kyle Montague provided feedback on early design concepts.

WhatFutures is a direct response to the discussion of the literature presented in the previous section. In particular it attempts to overcome some of the identified issues with developing bespoke software and applications for engagement and coordinating participation. Furthermore, it describes an initial attempt to conceptualize social media technologies as design material, through a reflective design process. This conceptualization is later expanded upon in Chapter 4 and contributes to the formulation of the model of unplatformed design.

WhatFutures is a collaborative future forecasting engagement for global youth that is based on WhatsApp. I designed and deployed WhatFutures in collaboration with the International Federation of Red Cross and Red Crescent Societies (IFRC). As well as a detailed account of

³ Lambton-Howard, Daniel, Robert Anderson, Kyle Montague, Andrew Garbett, Shaun Hazeldine, Carlos Alvarez, John A. Sweeney, Patrick Olivier, Ahmed Kharrufa, and Tom Nappey. "WhatFutures: Designing Large-Scale Engagements on WhatsApp." In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*, pp. 1-14. 2019.

the design process I undertook, this chapter also situates the design of WhatFutures in relevant literature. I detail the design goals underpinning WhatFutures along with an accompanying description of its pilot deployment across five countries, which successfully engaged 487 participants in generating 95 individual pieces of crafted multimedia data as well as 16,100 messages in support of the IFRC's strategic planning goals. My analysis of the results of this pilot deployment show that the structures and processes I employed on WhatsApp have great potential for engaging large distributed populations in the creation of information-rich qualitative data. This is further evidenced by the IFRC's decision to later globally deploy WhatFutures with nearly 4,000 participants from 120 countries. I present a reflection upon the design decisions underpinning WhatFutures and identify how decisions made around group structures, processes and externalization of outputs influenced engagement and data quality. I conclude with the wider implications of these findings for the design of engagements that best utilize the affordances of existing messaging applications.

3.1 Research Background: The International Federation of Red Cross and Red Crescent Societies

In early 2017, my research lab was approached by the International Federation of Red Cross and Red Crescent Societies, a large humanitarian organization with an estimated 17 million volunteers worldwide, 9 million of whom are under the age of 30. In 2017 the IFRC had embarked on a 3-year long series of horizon scanning activities to inform the creation of its *Strategy 2030*⁴, a strategic vision of the organization for the next ten years. This was to culminate in the generation of a federation wide policy that is submitted to and voted for approval by its *General Assembly*. They had approached the research lab with a significant concern, around meaningful inclusion of the voices of their young volunteers in this process:

⁴ <https://future-rcrc.com/s2030-framing/>

‘Surveys have been primarily used previously to achieve this input but have been shown to have limited value for this purpose and particularly struggle to engage appropriate representation from the millions of youth volunteers that [IFRC] has in developing and emerging countries.’ (Head of Innovation, IFRC).

The IFRC were concerned that the voice of young people should be central to the consultation process around Strategy 2030 but were coloured by their past difficulties engaging young people in organization-led initiatives through bespoke digital platforms and echoed Kentaro Toyama’s assertion that *‘technology projects should seek to amplify the impact of existing institutions that are already contributing successfully to development goals’* (Toyama, 2011). A consequence of this was that early in the design process the IFRC indicated a preference to incorporate WhatsApp in the engagement activity, given its widespread use throughout the developing world (SimilarWeb, n.d.) and by young volunteers to talk between themselves and their local volunteer organizations. A second priority for the IFRC was that the complexity of the issues facing humanitarian organizations could be addressed in the engagement activities, and that it would provide a space for dialogue around authentic and localized accounts of challenges and elicit innovative grassroots responses. Finally, the outcomes of the activity must be rendered in forms that can readily be incorporated into the formal future forecasting process. Given the ultimate target of many thousands of participants (in an anticipated full-scale global deployment) the risk of being overwhelmed by large quantities of unstructured qualitative data was a major concern for the IFRC.

3.2 Platforms for Engagement

WhatsApp is the world’s most popular messaging application, used by tens of millions of people daily (Statista, n.d.). As the world’s most popular messaging application, it offers significant opportunities for improving the reach and effectiveness of engagement projects. Ostensibly a secure multimedia messaging tool, in the last few years WhatsApp text chats have been used as a means for young people to source credit in Durban (Kariuki & Ofusori, 2017), repurposed for classroom communication (Bouhnik & Deshen, 2014), for monitoring election fairness in South Africa (Ofusori & Kariuki, 2017) and even for issuing court summons

in India (Sura, n.d.), to name just a few. These examples use WhatsApp text messages as a direct means of communication as it offers a low-cost and effective way for organisations, institutions and businesses to engage with clients, customers and employees. Here WhatsApp acts as an alternative to other digital means of communication (e.g. email).

Increasingly however, as organizations and institutions embark on large scale strategic planning and engagement projects they seek to include the voices of large and diverse groups of stakeholders. Typically, workshops and focus groups are used to produce the rich data and insight that are vital to these processes, however, these methods are simply unsuitable for projects that seek to work at scale and across geographies (Morgan, 1997). The multimedia affordances of WhatsApp could be repurposed to this end, however it is not designed with productive collaborative activity in mind, has no available API and limited customizability.

In the following section I provide a brief account of related work that provides additional background to this specific research context. However, as WhatsApp research overwhelmingly consists of studies of its real-world usage patterns (as opposed to explorations into repurposing WhatsApp for engagement), this literature review focusses on collaborative crowdsourcing and engagement games, with a focus on how they have addressed similar design challenges including motivating and organizing large groups of distributed people towards collective action. This short literature review is an extension to the one found in previous chapter, intended to give a clearer picture of the design challenges specific to this context.

3.2.1 Collaborative Crowdsourcing

Crowdsourcing is highly effective at organizing large numbers of people towards completing tasks. Often at a global scale, crowdsourcing, is a growing phenomenon that spans a range of industries and levels of expertise from micro-tasks such as translations and classification of images, to logo and t-shirt design for companies and individuals, up to complex solutions for innovation challenges set by organizations on open innovation platforms (Chesbrough et al., 2006). Within research, web-based platforms such as *Lab In The Wild* (Reinecke et al., 2015),

Sensr (Kim et al., 2013) and *Pybossa* (Pybossa, 2018) allow researchers to harness the power of the crowd to take part in behavioural surveys, act as sensors for citizen science projects or contribute to simple analysis of large data sets to name a few examples. Typically, these crowdsourcing activities are oriented towards the completion of tasks and performed by individuals in isolation, and so are unsuitable for deep collaborative generation of rich qualitative data. Law et al (Law et al., 2017) further argue that crowdsourcing is more suited to mechanical study designs and express uncertainty regarding the utility of using crowdsourcing within more exploratory and open-ended research.

Recent work into crowdsource platforms which incorporate peer production and collaborative mechanisms has yielded interesting results. For example, Retelny et al (Retelny et al., 2014) successfully explored how complex tasks could be divided up and distributed to small collaborative ‘flash teams’ on an online platform, Cheng and Bernstein (Cheng & Bernstein, 2014) investigated the use of ‘activation thresholds’ in supporting collective action and Kittur et al cite collaboration between crowd workers as being crucial for the future of crowdwork (Kittur et al., 2013) particularly for creative tasks (Kittur, 2010). All these approaches discussed above use and rely upon custom built software or web-app platforms. As such this makes them largely unsuitable for the tech-constrained deployment context of the developing world. Despite this they do offer useful insights into how activities can be designed to support productive collaboration between peers (e.g. through allocating responsibilities across a creative team) and point to the value of this collaboration in improving the quality and creativity of the output.

3.2.2 Engagement Games

One approach to focusing distributed crowds in engaging activities and collective effort can be found in serious Alternate Reality Games (ARGs). ARGs are large scale, trans-media games where players collaboratively unravel and unlock mysteries using clues scattered across physical and digital media and have been designed and enjoyed by thousands since the early 2000s (Kim et al., 2008). ARGs take many forms but primarily their design focusses on the

creation of engaging, participatory experiences which blur a game's 'magic circle' with real life experience through the use of game mechanics and interactive fiction (Bonsignore et al., 2014). Serious ARGs have more serious goals, and it has been argued, can be used in the cultivation of collective intelligence, awareness building and participatory learning (JafariNaimi & Meyers, 2015; Salen, 1995; McGonigal, 2011).

One such serious ARGs that can be seen as generating large amounts of qualitative data is World Without Oil (WWO) (McGonigal, n.d.). WWO sought to engage its players in blogging around imagining the serious repercussions of a future of global oil shortage. This game attempted to leverage collective imagination to chart potential futures, and build community awareness of global issues and solutions (McGonigal, 2011). Although WWO succeeded at generating insight on future forecasting activity from their players, JafariNaimi and Meyers' analysis of contribution and participation patterns (JafariNaimi et al., 2014; JafariNaimi & Meyers, 2015), point out a number of problems with the data resulting from the game design. Firstly, they highlight that the vast majority of data was generated by a small but 'hyper-engaged' group of players, along with the game designers, resulting from a very high level of drop off in the early stages of the game. The authors' attribute this to a lack of formative feedback within the game to inform players how they are doing relative to their own and others' play. Further studies have shown that the absence of formal game structures in ARGs also forces motivated players to create their own structures and co-opt tools in order to play effectively (Young et al., 2013; Peyton et al., 2013).

An example of how game structures can be leveraged to sustain and structure collaborative activity can be found in the concept of engagement games by Gordon et al (Gordon et al., 2016). Engagement games are games that attempt to use game design techniques to transform civic processes to make them more accessible, transparent, and engaging. Similarly, Devisch et al (Devisch et al., 2016) identify the role gameful design plays in fostering 'collective reflection'. A prominent example, Community Planit (Gordon, n.d.), is a workshop and web-based engagement game where citizens are invited to take part in a series of time-limited missions. These missions involve answering simple questions about their experiences

of their city. Answering questions and interacting with other player's answers earns in-game currency, which can be pledged to player submitted local projects and causes. Community Planit is an example of how compelling game structures can be used to generate high quality data to support existing civic processes, whilst at the same time creating an engaging and entertaining participatory experience for players (Gordon & Baldwin-Philippi, 2014). Approaches like Community Planit point again to the effectiveness of game structures in productively focusing participants towards a shared goal, whilst facilitating the deep peer communication that contributes to high quality qualitative data. However, a web-based application is less suitable to contexts of low tech-literacy or lack of access to technical resources (e.g. rural areas of the developing world).

3.3 WhatFutures design goals

The overall design of WhatFutures as an engagement, draws on a legacy of insights and successes from previous approaches to digitally mediated distributed coordinated action. Firstly, work on collaborative crowdsourcing has shown the value of using group structures and roles in supporting distributed group production (Retelny et al., 2014; Forte et al., 2012; Kittur et al., 2013). Secondly, some of the most successful civic engagement applications have utilized gameful design to motivate participation and structure collaborative data generation (McGonigal, n.d.; Gordon, n.d.). Finally, as detailed in chapter 2 of this thesis, recent work on the appropriation of existing social media technologies has demonstrated the enormous opportunities of leveraging their affordances to engage with distributed populations (e.g. (Prabhakar et al., 2017; Celina et al., 2018)).

Through frequent meetings with the IFRC we established that the IFRC had three main requirements for WhatFutures. Firstly, and evidently, that it be an improvement over previous attempts in terms of engaging their young volunteers in strategic foresight. Secondly, that the complexity of the issues facing humanitarian organizations could be properly understood and investigated by young people, resulting in authentic and localized accounts of challenges and innovative grassroots responses. Finally, that the outcomes of

WhatFutures must be rendered in forms that can readily be incorporated into the overall Strategy2030 process. As an additional note, the IFRC were particularly motivated by the use of gameful design, as they believed that their young volunteers would be more motivated to participate with a game than a traditional engagement process. As such the decision was taken early to refer to and internally promote WhatFutures as a game. These requirements, and closely related issue identified by the IFRC, can be summarized as three design goals (DGs):

DG1 Improving Engagement. Increase the quantity, duration and depth of engagement by lowering barriers to participation and through gameful design. (JafariNaimi & Meyers, 2015; Gordon et al., 2016; McGonigal, n.d.; Deterding et al., 2011).

DG2 Tackling Complexity. Support participants in understanding complex global drivers of change, in reflecting on these, and in expressing their local perspectives on this change. (Retelny et al., 2014; Seltzer & Mahmoudi, 2013; Kittur, 2010; JafariNaimi & Meyers, 2015).

DG3 Generating Rich Data. Generate rich multimedia artifacts that communicate the authentic insights of young volunteers that can be used meaningfully in strategic deliberations within the IFRC.

From the perspective of my research, this provided an opportunity to test some of the ideas and concepts that I had been thinking about at scale. Particularly in the potential for using already adopted technologies and game design techniques to lower barriers of engagement to participation, a problem that I had encountered in my previous employment as young people's programmer at a contemporary art gallery. I had designed some previous engagement games using social media technologies as part of a public consultation process (Crivellaro et al., 2019), and was looking for an opportunity to test these nascent ideas at scale. The design goals outlined above were therefore supplemented by the broader HCI goal of establishing a proof of concept of the gameful use of existing social media technologies to structure a large-scale participatory process.

3.3.1 Designing with WhatsApp

To achieve the design goals outlined above, I entered into a series of exploratory investigations of WhatsApp in respect to understanding the possibilities afforded by its functions and features. What became immediately apparent is the simplicity of actions available to users of WhatsApp (highly likely a factor in its widespread adoption). Primarily, WhatsApp allows users to form 1-to-1, 1-to-many and many-to-many groupings with other users, and to both send and receive text, audio, image and videos within those connections. Furthermore, WhatsApp has the ability for some users to have administrative rights over these groupings, and for users to be able to export (with some appreciable difficulty) the text and multimedia content of these groups.

I conducted a small-scale lab-study with 22 colleagues, where I simulated various creative assignments (utilizing the different multimedia affordances) of different sized WhatsApp groups. I also experimented with connecting groups through interlinked membership, in order to establish the possibilities of information dissemination through groups. The lab test was largely successful as both a proof of concept (it is possible to engage people in the collaborative generation of rich multimedia data through WhatsApp groups) and in highlighting a number of places where the limitations of WhatsApp would need to be circumvented or improved. Through reflecting upon the manifest interactions and behaviours of myself and colleagues within this lab test, I formalized these manipulatable properties of WhatsApp into four qualities: *morphology, role, externalization and process*.

Morphology. The size, membership criteria, and connectedness of WhatsApp groups characterizes the qualities and dynamics of interactions between participants. For example, the size and membership of a group has a significant impact on factors such as mutual understanding, group cohesion, and a group's capacity for decision making (David W. Johnson & Johnson, 1999; Lee & Paine, 2015; Johansen, 1988). Likewise, the connections between groups, realized through overlapping membership, is the channel through which information and knowledge diffusion can occur and can be influenced.

Role. Stemming from the simplicity of its intended use, WhatsApp only enforces two distinct group roles: *group members* (who can contribute to group chats) and *group admins* (who can also control membership). Yet the assignment of roles to group members shapes their behavior in the activity, both at the individual level and group level. For example, roles foster identity and a sense of responsibility, and can be a powerful mechanism for scoping anticipated contributions of both participants and groups, and make expectations concerning division of labor explicit (D W Johnson & Johnson, 1999; Retelny et al., 2014; Cohen & Lotan, 2014).

Externalization. WhatsApp is designed so that only members of a group have access to content produced by other members (i.e. their multimedia messages). Externalization considers how, when and whether such content is made visible more generally (both during and after the engagement); and how this visibility of content drives behaviour, knowledge exchange and a sense of collective action or competition.

Process. Membership of a WhatsApp group has no associated expectations of participation other than those that are implied by its membership or informally agreed by its members (e.g. posting family pictures in a family WhatsApp group). *Process* is the series of actions and/or steps that participants are required to take in order to achieve the desired outcome of the engagement. Key process challenges are the communication, execution and regulation of the process with the limited administrative powers that WhatsApp affords.

The results of the lab test, comprising of an early proof of concept and examples of generated data, were then shown to the IFRC. This led to a 2-day design workshop with the IFRC in order to refine the design concept according to what would work best for their volunteers. With these insights, I then revisited the four qualities above and created and produced a design that responded to the initial design goals, and could also be enacted through the limited affordances of WhatsApp. I now present the final design, as well as its constituent elements in the following section.

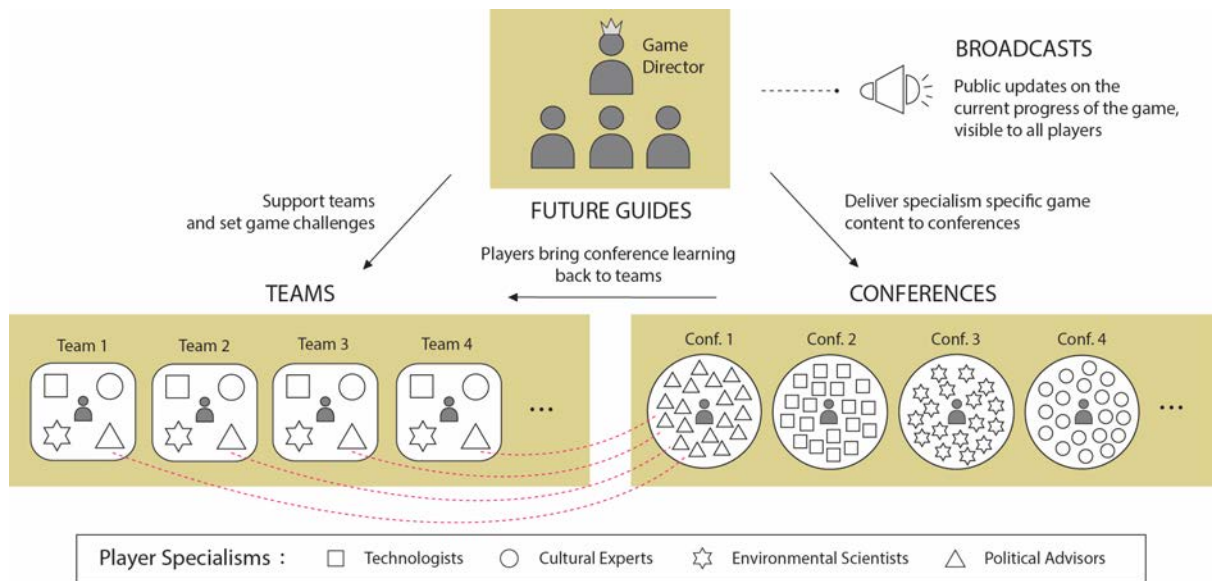


Figure 1. The components of WhatFutures

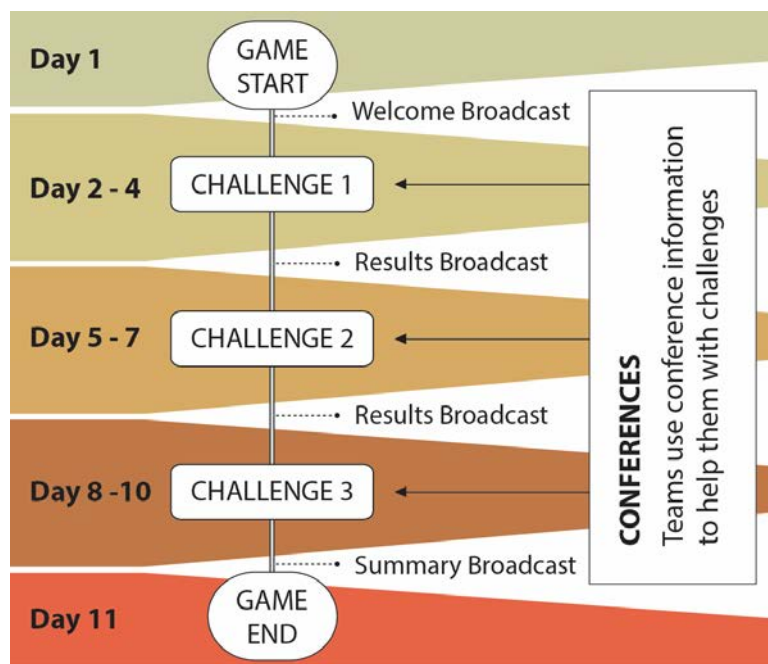


Figure 2. WhatFutures' timeline

3.3.2 The Design

I designed WhatFutures to consist of a number of interlocking components (see figure 1). This section describes each one in turn, and then ends with a description of the overall process of WhatFutures.

Teams

For real-time peer production and collaboration to occur, players must be able to communicate with other players with a shared goal, as evidenced by work in peer production in 'flash teams' (Retelny et al., 2014). To this end, players in WhatFutures were to be grouped together into small teams. These teams act as the basic unit of the morphology of WhatFutures and as the primary place where players work collaboratively to generate rich qualitative data. In teams, players take part in the activities set during the game and are intended to be the place where players explicitly contribute to the collaborative production of multimedia artifacts in response to the game's challenges (DG3). Due to morphological considerations, I restricted team sizes to 4-8 players so as to be small enough for individual players to be comfortable contributing to team activity, but also large enough so that activity and work could be distributed amongst its members (DG2).

Specialisms

The benefits of assigning roles in groupwork activities are well documented (Cohen & Lotan, 2014; D W Johnson & Johnson, 1999). Roles enhance positive interdependence - the sense that individual success depends on group success, and individual responsibility. Both of which Johnson and Johnson (D W Johnson & Johnson, 1999) argue are crucial for successful group work (DG2). Multiple roles allow for the creation of shared understanding through collaborative grounding (Baker et al., 1999), allowing the group to respond to complicated scenarios with a sophisticated depth that stems from analysis from multiple perspectives (DG2). Additionally roles can help increase overall engagement by giving players a tool to

express their own personal interests and identity and are important elements of gameplay (Waggoner, 2009; Jesse Schell, 2008) (DG1) and learning (Gee, 2003) (DG2).

The IFRC were particularly interested in how global drivers of change (e.g. climate change, demographic shifts, migration etc.) may impact local communities. To this end, I identified four specialist roles that players could choose in the game that would encompass the four large drivers for future change specified by the IFRC (DG2). The specialisms were technologist, cultural expert, environmental scientist and political advisor. Much like the roles chosen in traditional pen and chapter role-playing games (e.g. warrior, thief, wizard), these roles were designed to give each player a unique perspective, and unique responsibilities within their team (DG1).

Conferences

A conference is a large group of players from different teams, who all share the same specialism. Modelled after the idea of 'guilds' found in massively multiplayer online roleplaying games, where groups of players band together towards a shared goal. Players who join guilds are generally rewarded with tighter social cohesion, loyalty and a sense of group identity (Pisan, 2007; Seay et al., 2004), all of which are desirable goals for maintaining engagement (DG1). Furthermore, by placing together players with shared identities and goals, conferences were designed to be places where 'communities of practice' (Wenger, 1998) could emerge. This was intended to be supported through the creation and sharing of specialism specific resources within these conferences.

To help players explore their specialisms further I collated existing multimedia content around future foresight, organized into four corresponding themes of technology, culture, environment and politics. This material was to be presented in the conferences for each specialism, to provide anchor points for discussions. The conferences were designed to be places where players could meet other players outside of their own team and engage in peer learning. The intention here is that due to the morphology of overlapping membership, the

peer-to-peer learning and exploration that took place within the conferences, would be brought back by individual players to their respective teams for further discussion and synthesis into the team's responses to the major challenges of the game (DG2). See appendix A.6 for details of each conference.

Challenges

A key concern for the design are decisions around how exactly participants would generate usable insight for the IFRC. To this end the IFRC identified three questions that they had developed as part of their previous Strategy 2030 engagements, that they particularly wanted to gather data on: *what challenges do young IFRC volunteers think their local communities will face in 2030? What opportunities will arise from these challenges in 2030? And how should the IFRC adapt to meet these challenges and opportunities in 2030?* In collaboration with the IFRC, I used these to design three challenges that would be presented to players of WhatFutures during the game. I configured them as multimedia challenges, so as to give teams the opportunity to enjoy creating videos, audio and images (DG1), and to create immediately accessible insight for the IFRC without the need for further processing (DG3).

Challenge 1: Work with your team to produce a news story from 2030 about the biggest challenge facing your society.

Challenge 2: Create an advertisement for an innovation in 2030. It could be a new product, service or initiative.

Challenge 3: Record a message to the Global Secretary General of the IFRC updating her from the front line of an innovative disaster response in 2030.

These challenges were produced as image files to be posted within each team's WhatsApp group (DG1) and contained supporting sub questions to help the player's approach and break down these large and open challenges (DG2). They can be viewed in full in appendix A.5.

Administrators (Future Guides)

To support the overall process, I identified the need for an additional administrative role, which I named Future Guides. Their primary function was to help players who have questions or need assistance and to be the first port of call for any queries players may have regarding the game. Due to the lack of API for WhatsApp, Future Guides were also to facilitate the delivering of content within the game by posting challenges, gathering data, and transferring multimedia content into and out of WhatsApp groups (DG1). Morphologically this necessitated a Future Guide within each team and conference group. Additionally, I took on the role as 'game director', so I could assist the Future Guides in their role, and ensure the smooth running of the game overall.

The IFRC identified an existing group of motivated young volunteers to take the role of Future Guides (see appendix A.2). I designed a training program, which was to be delivered by myself over WhatsApp in 30-minute chunks over 3 days, to train nine of these volunteers to act as Future Guide. This training program involved the volunteers preparing for the game by practicing support activities such as posting challenges, exporting chat transcripts and uploading multimedia files to a Google Drive repository (DG1). See appendix A.3 for documents used in this training. Each Future Guide would then be assigned between 10 and 14 teams. They would be responsible for setting up these teams' WhatsApp groups at the start of the game, posting the game information and challenges to them, exporting the teams' responses to the challenges, exporting transcripts (with consent) of the teams' conversations, and generally providing support to their teams by answering questions and offering suggestions if any players were struggling with any aspect of the game (DG1).

Broadcasts

During the design process, it became clear that the visibility of activity in WhatsApp - the quality 'externalization' – would require some additional design. By default, communication on WhatsApp is only seen by those who are members of a group, without some way of making

this private communication public, players in WhatFutures would be unable to see the activity of any other players. This led me to the design of 'broadcasts', in the form of an online leaderboard, designed to provide an externalized overall summary of the game that is available and visible to all players, and to act as a feedback loop. Feedback loops are an intrinsic component of any game as they allow a player to judge their actions and compare themselves to other players or to the rules of the game system (Salen & Zimmerman, 2003) and to receive feedback - an important condition for engagement (Garris & Ahlers, 2002) (DG1). They were also designed to contribute to a sense of epic scale, that imbues players with a sense of being part of something bigger than themselves which McGonigal (McGonigal, 2011) identifies as a prime factor in fostering engagement and motivation in gameplay (DG1).

After each challenge in WhatFutures, the responses would be assessed by leaders of the IFRC innovation team who would pick the top 10 and present these on the IFRC innovation website publicly for all players to see and comment upon. In this way the leaderboard would externalize the current state of the game and bring an element of friendly competition where players would judge the quality of their responses based on their positions on leaderboard, and potentially seek to better this for the following challenge (DG1).

Overall Process

In terms of overall process, WhatFutures was designed to be a real-time game event that runs for 10 days (see figure 2). Participants would sign up to play on a small website in advance of the game, either individually or as part of a team. When signing up, each participant would be asked to choose one of four specialisms. At the start of the game a WhatsApp group will be created for each team containing the team members and a game administrator. After a day of ice-breaker activities, the teams would then be assigned the game's first main challenge by the future guides with a deadline of 3 days to produce a response. Additionally, each team member will also be invited to a larger separate WhatsApp group containing players from other teams who all shared the same specialism, in order to discuss different global drivers of change. After the challenge deadline, a leaderboard of the best responses

will be presented on a website, a link to this will then be broadcast within the groups, and the second challenge be set. This pattern would then be repeated for the final challenge. Alongside and supporting each challenge, smaller lightweight activities will be set within the conferences. The game will then culminate in a final summary leaderboard.

Infrastructure

Players signed up for WhatFutures on a small micro site where they could register with their details and WhatsApp number to play the game. They would then be asked to choose which specialism to play. Players could start a new team, upon which they would receive a share code delivered via SMS to share with friends who wished to join their team (DG1). Twilio⁵ was used to verify phone numbers during player registration and send SMS. Screenshots from this micro site can be viewed in appendix A.4. Google Drive⁶ was used to support the sharing of content and material from the game, as it integrates with the share function on WhatsApp. Players would also be invited to join their specialism's conference via a WhatsApp group 'share code' sent by an automatically generated SMS from Twilio once the game had started (DG1). The IFRC Innovation WordPress website was used as the leaderboard.

3.4 Study Design

3.4.1 Recruitment of Participants

WhatFutures was promoted to volunteers from the national societies of Kenya, Finland, Bulgaria, Australia and Hong Kong through the IFRC's internal channels and marketed as an opportunity to take part in a pilot game in lieu of a larger organization wide game. These countries were selected to offer good geographical coverage and to respond to internal

⁵ <https://www.twilio.com/>

⁶ <https://www.google.com/drive/>

political issues. An internal ‘one pager’ detailing the project was produced (see appendix A.1) however due to the deeply hierarchical communication channels of the IFRC (where local branches report to national, who in turn report to regional and then international, each being independently responsible for recruitment methods and relaying of information), it is difficult to ascertain how many volunteers were reached by this internal promotion, or even what methods of promotion were ultimately used. In total, 487 volunteers signed up to play WhatFutures (283 female, 193 male, 11 other) with a mean average age of 24.4 years (SD=7.17), 125 of these accessed the WhatFutures microsite through a friends’ share code. Overall, players constituted 100 separate teams, with a modal average of 5 players per team (table 1). As the IFRC were interested in local responses, each team contained players from the same country so as to be playing the game from similar contexts. To ensure informed consent, players acknowledged terms of use upon signing up on the site, and also directly to Future Guides within WhatsApp.

	No. Players	No. Teams
Kenya	191	36
Bulgaria	118	22
Australia	74	17
Hong Kong	65	14
Finland	39	11
Total	487	100

Table 1. Player and team distributions in WhatFutures

3.4.2 Data and Analysis

The study gathered three types of data. 1) Multimedia data (videos, articles, audio) created by teams in response to the game’s challenges, transferred from the team’s WhatsApp group to a shared Google drive by Future Guides. 2) Text data in the form of exported chat transcripts from WhatsApp. Consent was obtained before Future Guides used the export chat function. All exported chats were anonymized. 3) Responses to a post-game survey sent via

email to participants shortly after the game ended. To provide additional context, we also present post-deployment data based on interviews and real outcomes with the IFRC.

Analysis of the multimedia data was performed via application of a modified structure of observed learning outcomes (SOLO) taxonomy (Biggs & Collis, 1982). The SOLO taxonomy is a model that categorizes levels of increasing complexity in students' understanding of subjects. Text data was analysed through automated topic modelling using Amazon Comprehend (Amazon, 2018). The results of the post-game survey are presented as is.

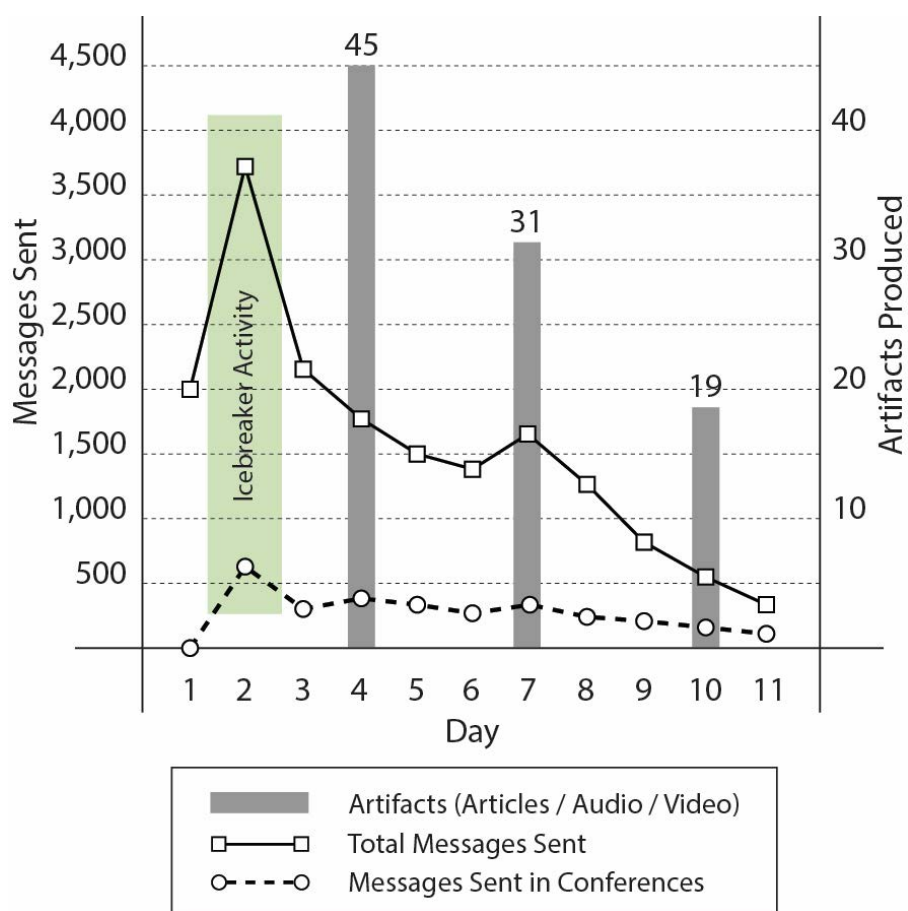


Figure 3. Player engagement as measured through production of messages and multimedia artifacts

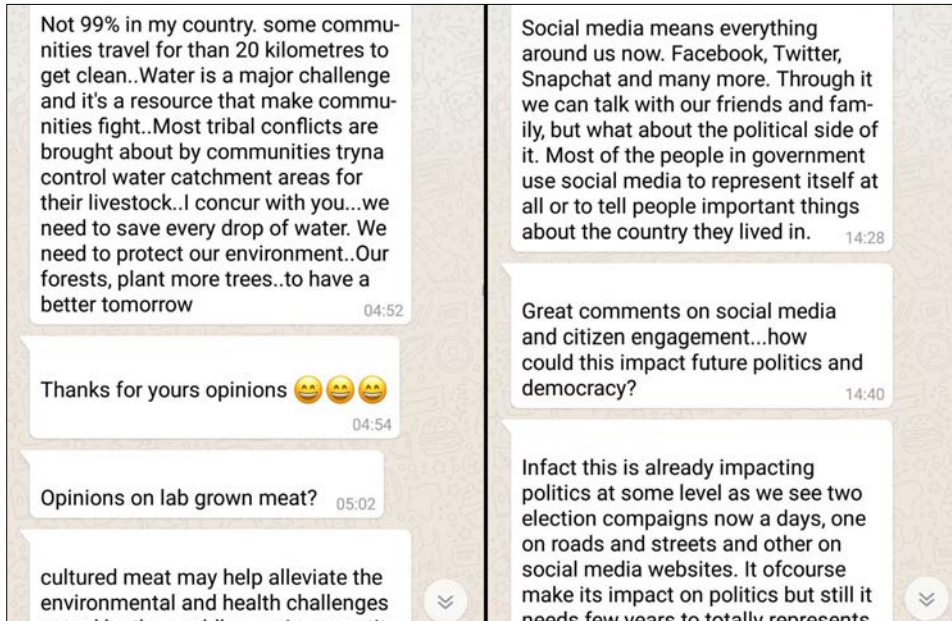


Figure 4. Examples of multimedia artifacts created by teams, taken from the IFRC Website. Including videos detailing innovations in disaster response, community resilience, rising sea levels as well as an audio report on an accident involving an autonomous vehicle.

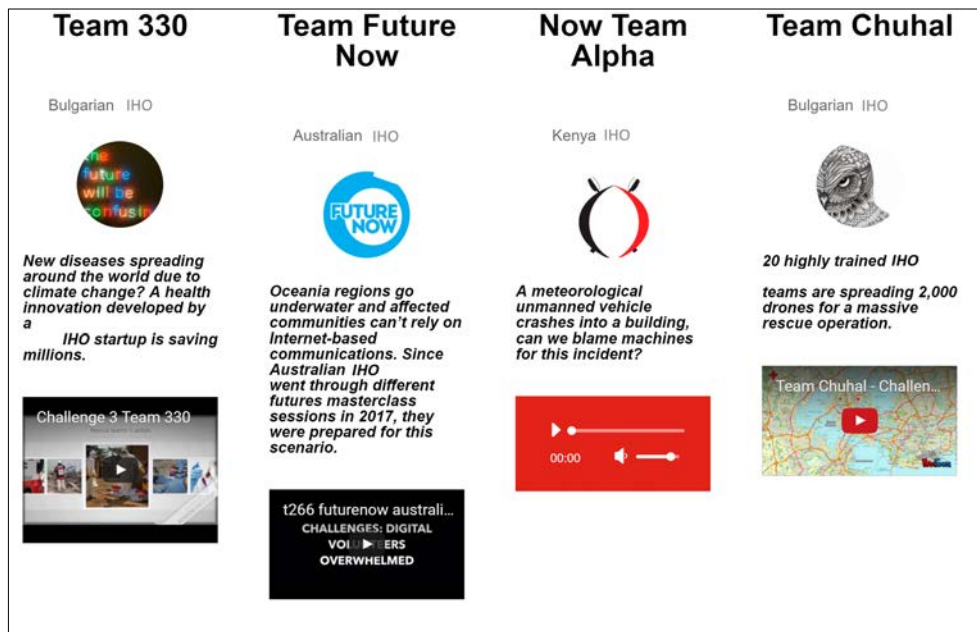


Figure 5. Sample messages from two conferences. On the left, environmental specialists discuss real tensions caused by water shortages and lab grown meat. On the right, political advisor specialists discuss the impact of social media on politics.

3.5 Findings

WhatFutures ran from 9th to 19th June 2017, during which time 16,100 messages were sent and 95 digital multimedia artifacts were created. These highly crafted artifacts consisted of videos, audios and magazine articles about the challenges and opportunities for the IFRC in 2030, examples of which can be seen in figures 4 & 5. Figure 3 shows a breakdown of player engagement throughout, as measured by volume of messages sent per day and the production of multimedia artifacts in response to the game's three challenges. The chart shows a sharp spike of activity around and after the introductory 'icebreaker' day, and then a general steady depreciation with a small peak of activity around the deadline of second challenges, this is generally consistent with engagement patterns reported in previous large scale engagement projects, for example in the World Without Oil ARG (JafariNaimi et al., 2014).

3.5.1 Multimedia data

Overall, 95 individual digital multimedia artifacts were produced in response to the game's challenges. Out of the 100 teams who took part in the game, 45 produced multimedia responses to the first challenge, 31 for the second and 19 for the third. Approximately, this data was created by 45% of the player base for the first challenge, and 31% and 19% for the second and third challenges respectively. 14 of the teams who responded to the third challenge also responded to the first and second, indicating a subset of dedicated teams who produced responses to each challenge. In respect to origins 43 were from Bulgaria, 25 from Kenya, 12 Australia, 11 Finland and 4 from Hong Kong.

In order to assess the quality of this data, and therefore its usefulness to the IFRC, I employed a modified version of Biggs' Structure of Observed Learning Outcomes (SOLO) Taxonomy (Biggs & Collis, 1982) to classify each artifact according to the sophistication and depth of its content. Although frameworks for data quality exist, these primarily rely on accuracy/truthfulness as a key measure for quality (Knight & Burn, 2005; Stvilia et al., 2007), which is not an applicable factor for a data set that is largely concerned with future forecasting

and foresight, and is therefore unverifiable at least at the time of publication. Biggs' SOLO taxonomy in contrast provides a rubric for measuring the quality of a piece of information according to the sophistication of its internal structure. I adapted the rubric to focus on evaluating the issue-focused nature of the game's three challenges, and constructed a rubric that consists of 5 levels indicating increasing quality of contained information:

Pre-structural. The artifact does not respond to the challenge; is in the wrong format and/or provides irrelevant information.

Uni-structural. The artifact focuses on an issue and provides some single information about it (e.g. a problem it causes)

Multi-structural. The artifact focuses on a single issue and provides multiple distinct aspects to it, such as multiple associated problems, but these are treated distinctly, OR the artifact lists multiple issues in isolation.

Relational. The artifact details an issue or issues as a coherent whole and placed in context with causes, effects and possible solutions.

Extended Abstract. The artifact, as well as detailing a coherent issue, also places this issue within the context of wider abstract concepts, such as implications on governmental policy or the organization and work of humanitarian institutions

This adapted rubric was applied by myself and another researcher to a sample of 10 artifacts to cross-compare classifications and ensure consistency. Once agreement in classification was established, the remaining 85 artifacts were then classified by myself. A classification of multi-structural or above would indicate data with enough informational quality as to be useful for the IFRC's strategic considerations. See figures 6 & 7 for a breakdown of data quality by challenge.

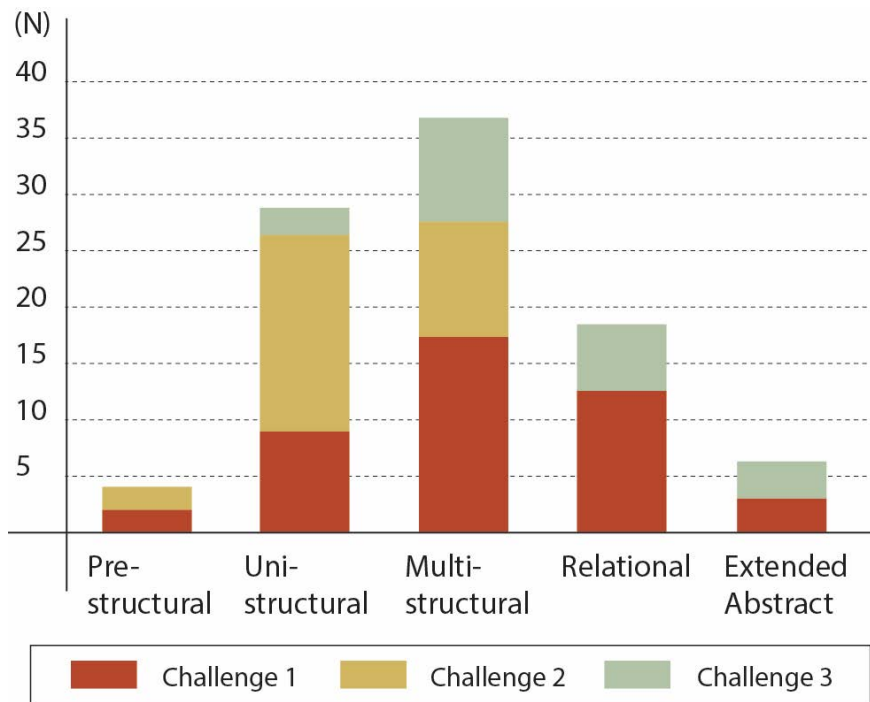


Figure 6. Overall data quality of multimedia artifacts for each challenge

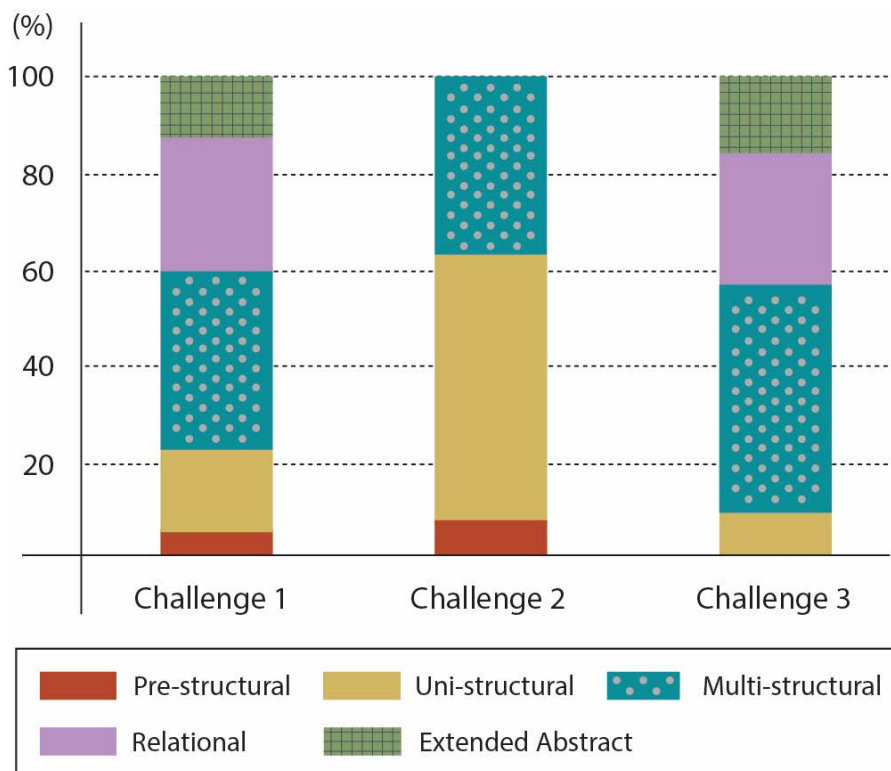


Figure 7. Percentage of each quality level per challenge

3.5.2 Text data

As well as multimedia artifacts, players of WhatFutures generated a large corpus of text data. 16,100 messages were sent during the game: 2,414 in conferences and 13,686 in teams (figure 3). A message can consist of anything from a single word utterance up to multiple paragraphs. In terms of engagement, each team on average produced 136.86 (SD=242.76) messages - a significant amount of text data. The 10 most productive teams (in terms of total messages sent) contributed 6606 messages (48.27% of all messages sent by teams) over the duration of the game. Although most teams sent over 75 messages, the 10 least productive sent only 138 (1.00% of total).

This data consisted of multiple text files exported directly from WhatsApp by Future Guides. I performed four stages of data processing. The first stage used Python to parse and combine the text data into standardized formats and annotate each message with the corresponding metadata of the messaging player's country and team affiliation. The second stage used Amazon Comprehend (Amazon, 2018) to perform automated topic modelling on the standardized data, to identify the most prominent topics. In the third stage I categorized each of the identified topics. Broadly I found each topic model could be classified into four main categories, interpersonal (22%), consisting of greetings and friendly conversation; administrative (35%), consisting of team coordination and distribution of activity; substantive (39%), consisting of expressions of views and opinions directly related to 2030 and the challenges of the game; and unknown (4%), largely consisting of emoji data. These categories were created as broader conceptions of the classifications of communication employed in Soller's (Soller, 2007) and Celina's (Celina et al., 2018) investigations of communication patterns in collaborative learning systems. Finally, subsets consisting of all the messages from each country were also put through Amazon Comprehend to identify country specific topics. I then grouped these topics under broad themes and were able to further identify a subset of themes unique to each country. A sample of these substantive themes can be seen in table 2.

Country	Australia	Bulgaria	Finland	Hong Kong	Kenya
Key Themes	Climate Change, Waste	Natural Resources, Society & Values	Refugees, Religion & Culture, Waste	Ageing Population, Climate Change	Water, Climate Change, Drones,
Local Issues	Cultural Tensions, Bushfires	Religious Decline, Litter & Waste	Social Isolation, GM Foods	Housing Issues, Residential Care	Poor Governance, Direct Aid Education

Table 2. Sample themes and country specific issues identified from topic modelling of text data

3.5.3 Post-Game Survey

A post-game survey was sent via email to all the players a few days after the game had ended, to assess how players had found their experience and to inform further iterations of WhatFutures. The survey also intended to assess the reasons why some players did not engage with the game, either in the teams or within the conferences. The survey had a two-part design, where respondents who self-reported as being engaged for at least half the duration of the game were asked questions around their experiences of the game, and where respondents who self-reported playing for less than half were asked questions about why they had not engaged.

The survey had 101 respondents (68 female), which constitutes 20.7% of the total player base. Of these respondents, 72.8% reported playing for at least half of the game or more. When asked how seriously they took their contributions to the game and how accurately these reflected their genuine thoughts and feelings about the future, 87.7% of these respondents reported that their individual predictions about the future were *'serious'* or *'very serious'*, and 82.2% reported that their team's responses to the challenges were *'serious'* or *'very serious'*. *'...It was fun to be creative and forecast trends that would impact the world, and think about how I can respond/prepare...'* This suggests that those players who engaged with the game,

did so in the spirit of accurately portraying their thoughts and opinions about the future (DG3).

With respect to the individual structures of the game, this group reported positive reactions to the leaderboard broadcasts with 71.3% saying that it increased their motivation to play WhatFutures. Teams were also popular with 38.8% reporting scoring them the highest or second highest on the scale as *'enjoying a lot'*, or *'really enjoying'* being in a team. 58.9% reported somewhat enjoying participating in the discussions in the conference, suggesting that although conference activities in WhatFutures were enjoyed by the majority, 30 survey respondents did not enjoy them *'...It was very hard to keep up with the group chat and the essential details passed me by because there was so much talk in the main conference group'*.

Of the 27.2% of respondents who reported playing for less than half of the game, the main reason cited for their decreased engagement was belonging to an inactive team. *'There were around 3 nonfunctional team members in our team leading to only 2 people working on the tasks. There should be a way to evaluate and address this as it puts undue pressure on the active members. In our case, this spoiled the enjoyment, engagement and motivation level of the active members in our team'*. The next most reported reason was a perception of difficulty associated with the challenges. This difficulty was attributed mainly to the short three-day deadlines of the challenges, *'I would give more time for the challenges to be completed'* but also the nature of the activities with some respondents commenting that they felt too much like *'an assignment'*, and that it *'... felt more like a school group project or a competition than a game'*.

3.5.4 Post Deployment

Although the IFRC had attempted to engage digitally with their young volunteer populations before, WhatFutures was a meaningful improvement over previous projects. As reported by the IFRC's Head of Innovation:

“Rural volunteers in Kenya or in urban areas of Hong Kong can be extremely difficult to reach and to engage with from a global perspective, the game was highly successful at attracting a diverse audience directly and maintaining a substantive dialogue, an outcome that most other previous attempts have failed at. The numbers in this rollout are impressive, however the real outcome was the depth of engagement as evidenced through the types of conversations and sharing that went on in the groups and conferences. This ensures that the IFRC can now meaningfully incorporate a youth voice in S2030 deliberations and in particular a voice that is often excluded or marginalized, simply by tyranny of distance and communication options.” (Head of Innovation, IFRC)

The data generated has since been utilized by the IFRC to inform their Strategy 2030 process. Firstly, a selection of audio and video multimedia artifacts have been presented to decision makers within the global organisation as part of an exhibition during the IFRC’s annual general assembly in November 2017. The immediacy of video and audio has been reported as a key factor in its impact in this context, as well as unmistakably linking the artifacts to the young people whose faces and voices can be seen and heard unmediated within the artifacts. A large sample of the magazine article artifacts as well as a re-presentation of the key themes surfaced within the text data were combined into a ‘newspaper from the future’ and distributed to each delegate in the conference.

Through the case study I have also identified an interesting side-effect of WhatFutures in an organizational context. The IFRC reported that the game had flattened the organizations communication hierarchies and facilitated networking between volunteers:

“For a volunteer from Kenya to be able to communicate with volunteers and global staff would normally require a multi layered pyramid of communication through the enormous structures of the IFRC. This game connected volunteers directly and facilitated dialogue. Throughout the game many of the players became Facebook friends or connected in other social media channels... it is clear for some at least this initiative has opened up new lines of communication with other volunteers.” (Head of Innovation, IFRC)

This improvement of communication channels can be seen as a positive side-effect of WhatFutures and was echoed by player responses in the post-game survey.

3.6 Discussion

I will now discuss the results in respect to the initial design goals of the method and offer suggestions which I believe should bear consideration in the design of similar approaches.

3.6.1 DG1: Improving Engagement

As a solution to the problem of engaging distributed populations, WhatFutures has been shown to be successful within the context of the IFRC, offering an effective method of direct and meaningful engagement with youth volunteers. Although the novelty of the approach may have accounted for some uplift in participation, I attribute this success primarily to the utilization of a popular existing social media technology that was familiar to the intended player base. By using WhatsApp, WhatFutures overcame many of the hurdles associated with attempts to migrate users onto new and unfamiliar platforms. Participants were not required to download and install an unknown application, they did not need to be taught how to use new interfaces and they did not need to use or access any special equipment or software that they did not already possess or were already comfortable with. This approach significantly lowered the barrier of participation by adapting to the existing technological ecosystem of its intended user base. In this way, we can see using WhatsApp as responding directly to the challenge outlined in the literature review in the previous chapter, of widening engagement when designing participation.

However, the steady decline in participation throughout the project is similar to curves reported in other work (JafariNaimi et al., 2014), suggesting that although WhatFutures may have been successful in reaching a wider audience than previous attempts, it did not manage to sustain this engagement throughout. Belonging to an 'inactive team' was the most cited reason for dropping out of the game. For future deployments, I recommend building in more time at the start of a game for players to introduce themselves, build rapport and become familiar with the game and Future Guides, or even to change teams if necessary. One

suggestion would be the design of light-weight, team-building activities to further strengthen the social connection between players, thereby increasing overall engagement and reducing dropout rates.

Another aspect worth mentioning is the use of gameful and game-like structures. WhatFutures was partly inspired by massively multiplayer role-playing games and inherited similar game-like structures (roles, challenges, leaderboards). Whilst these were generally received positively, some comments in the post-game deployment survey indicate a mismatch in the expectations of some players. Indeed, the marketing and promotion of the game to volunteers (performed internally by IFRC) heavily rested on the game-like qualities of WhatFutures. This may have caused a mismatch between how gameful the engagement was perceived to be and how it was in reality, frustrating some players.

3.6.2 DG2: Tackling Complexity

The high amount of complexity and sophistication found within the multimedia artifacts produced during WhatFutures, is a reliable indicator of participant's understanding of complex global issues. Furthermore, I can attribute this understanding of complex issues to the structures employed in WhatFutures, namely the positive influence of specialisms and conferences in directly equipping players with differing perspectives and by providing the mechanisms with which to gather further related and contextual information about issues from peers and experts within conferences. Of course, the pre-existing understanding of global issues by players, as well as their general education levels, will also affect the quality of produced data. However, I can say that the structure of WhatFutures itself communicates an expectation of multi-structural, relational or extended abstract responses, and indeed facilitates the meeting of these expectations.

However, one risk is the potential for dominant narratives to emerge, either through biased curation and creation of expert information that is put into the conferences, or through louder player voices within these conferences. Here the risk is that a dominant narrative may subvert, mask or in other ways damage the authenticity and originality of player generated

data. Although analysis of the WhatFutures message data (table 2) shows that different topics and themes do emerge depending on a team's country, and to some extent dominant narratives outside the game (e.g. climate change) are unavoidable, care should be taken with specialisms and conferences to minimize their effect.

One approach in future deployments could be to incentivize originality through game mechanisms, such as by rewarding teams who discuss an issue or perspective on an issue that few other teams have. Another could be to frame conference activity around sourcing of counter narratives, or through the expression of individual perspectives, rather than reinforcement of widely reported perspectives.

3.6.3 DG3: Generating Rich Data

We can see that the majority of the multimedia artifacts submitted in response to the game's challenges are multi-structural or above (figure 7), and therefore of high enough quality as to be useful to the IFRC. We can also see that the largest amount of uni-structural multimedia data was produced in response to the second challenge (to produce an advertisement). This is likely because advertisements in general are designed to express at most, one simple message (usually to buy something), rather than nuanced complex arguments. Although the responses to this challenge were lower in terms of complexity, they were still very useful to the IFRC in terms of creating immediately engaging imagery and content. In this way we can also see that, the design of challenges within WhatFutures regulated data outputs so that they can be used immediately, without requiring further processing. For example, the IFRC selected some of the video responses from WhatFutures to be included directly in reports to decision makers within the organization, without needing any additional treatment or analysis. Similarly, news stories generated in the game, were incorporated almost immediately in an IFRC internal newspaper, thanks to their consistent formatting, style and tone.

In terms of the content of text data, topic modelling has brought to light numerous insights for the IFRC (table 2) to help inform strategic deliberations, and as such WhatFutures was

successful in generating information rich text data. In its raw form however, this data is difficult to navigate and requires multiple stages of processing to allow metadata to be embedded, topics and concerns to be surfaced, and made navigable for stakeholders. This limitation is not unique to WhatFutures however and can be found in any data project that generates large amounts of qualitative text data. This is also a symptom of having to use the WhatsApp's rather limited export chat functionality. This function offers no control over the format of text that is exported, therefore necessitating a process of data 'wrangling' using external tools. Naturally this has implications on future projects which seek to use text data generated within WhatsApp.

The leaderboard broadcasts within WhatFutures can be seen as having set expectations for player productivity, as they directly reported instances of 'good play'. The top 10 responses in each broadcast in WhatFutures were handpicked by the IFRC and tended to favor submissions of higher production quality and presentation standard, likely leading to a perception of a 'standard of quality' of good play. This is the likely cause of an increase in the fidelity of team's responses after each leaderboard. Conversely, this may have discouraged contributions from teams who were unable or unwilling to create higher-fidelity multimedia responses. A possible way of taking advantage of this effect could be to involve players themselves in the production of broadcast material. In this way, key themes or topics may be further surfaced through an extra stage of participatory analysis of data, as players identify elements that they feel are significant. Regardless, this finding illustrates the importance of 'externalization' of player activity in respect to how it can be used to normalize particular behaviour types (fidelity of submissions in this case). In this way, externalization is a key lever for enabling the conditions for communities of practice (Wenger, 1998) to flourish.

3.6.4 Global Deployment

By far one of the largest indicators of the success of WhatFutures as an approach to digital engagement, was the fact that the IFRC requested myself to run a large and fully global version of the game in 2018 (appendix B). This global game ultimately involved nearly 4000

participants across 120 countries, organized into 451 teams, taking part. The game was administrated by 27 future guides, with approximately 1/3rd of the game run entirely in Spanish. The game was simplified to 2 challenges (to compensate for increased logistical complexity) where the players generated around 200 multimedia responses, and around 80,000 WhatsApp messages. The global game itself was not run directly as a research project, and although large amounts of data were generated, it is not treated as part of this research. However, it does stand as a significant evidence of success of the WhatFutures approach.

3.7 Towards Unplatformed Design

Through designing with WhatsApp, I identified four qualities (morphology, role, externalization, process). These served as a pragmatic framework with which I structured the design of WhatFutures. However, revisiting these qualities allows us to map a trajectory from designing with WhatsApp, to the wider design space for distributed engagements based on augmentations of mainstream social media technologies. My choices as to morphology (group structure, size, membership) sought to facilitate the rapid formation of small groups, and access to sources of knowledge (both expert and peer) that would support the teams time-bounded responses to challenges. Yet the full scope of morphology is obviously greater. Designers of alternative orchestrations may consider the implications of groups as subsets of other groups; alternative intersections between groups; dynamic group formation (opening and closing); fusing of groups; multiple memberships; sizes of groupings to name just a few alternatives. Each of these has inevitable implications on the quality, aspect and coherence of any designed activity.

WhatFutures used the material quality of role (the specialisms and Future Guides) to respond to the challenges of understanding complexity and improving engagement. Role frames both how players relate to each other and their expectations of participation, and is a powerful tool for configuring the designer's intended qualities of participation. For example, dynamic role shifting; different levels of player agency in choosing roles; power imbalance between roles; roles as expressing different identities; and roles as matched (or not) to lived

experience. Clearly, the design space is much larger than explored in WhatFutures. Likewise, alternative designs for externalization, might have considered a different curatorial and editorial process to the competitive leader boards. For example, a collaborative project; a shifting narrative determined by participant choices; or news bulletins highlighting aspects of the engagement written by participants themselves. Similarly, the process created for WhatFutures was inspired by engagement game design and future forecasting activities due to the context of the deployment, but it is not hard to imagine alternative processes informed by other domains and activity designs.

This approach examined the material qualities of WhatsApp - morphology, role, externalization, process - and used these qualities to design WhatFutures. Yet the approach of framing existing platforms as design material with material qualities is a useful starting point for an exploration of a significant design space that has yet to be articulated. Both in terms of charting and understanding these qualities, but also how they can be used to design new types of engagements and to coordinate participation. These concepts are considered in much more detail in the following chapter, where they are examined in respect to other case studies of appropriation of existing social media technologies towards the formulation of the model of unplatformed design.

3.8 Chapter Summary

In this chapter I have provided a detailed description of a novel large-scale engagement, WhatFutures, designed and delivered on WhatsApp. Specifically, I have detailed how WhatsApp can be appropriated and designed with, in order to engage large numbers of geographically distributed participants in meaningful coordinated participation. I have evidenced and validated this through a description of a real-world deployment, and corresponding analysis, of WhatFutures, the outputs of which contributed to the strategic deliberations of the International Federation of Red Cross and Red Crescent Societies. Returning to the original design challenges raised towards the start of this chapter, there is clear evidence for utility of the appropriation of social media technologies as a means of

coordinating large-scale participation with under-represented communities. However, within the context of this thesis, this case study adds most value as through its conceptualisation of WhatsApp as a design material, with material qualities. In this way, it acts as a starting point for a more systematic understanding of the appropriation of social media technologies which I explore in the following chapter.

Chapter 4 Unplatformed Design: A Model for Appropriating Social Media Technologies for Coordinated Participation

In this chapter I introduce the central contributions of this thesis, the model for *unplatformed design*. A version of this chapter was published in *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*⁷. I was responsible for the concept, study design, data collection, data analysis and writing of the entire paper. Ahmed Kharrufa, Patrick Olivier, Vasilis Vlachokyriakos and Hanna Celina provided feedback on drafts and through discussion of the concepts.

I use the term *unplatformed* to differentiate the model from the typical approach (discussed in chapter 2) to sustaining digital participation through the creation of bespoke platforms, for example (Dow et al., 2016; Le Dantec et al., 2015; Rainey et al., 2019; Garbett et al., 2016). The model instead frames existing social media technologies as a resource for design that offers significant potential for sustainable and scalable ways of coordinating participation. The model itself is based on a close analysis of three exemplar projects in three distinct domains that have successfully coordinated participation through the configuration and augmentation of existing social media technologies: participatory future forecasting in WhatFutures (detailed in the previous chapter); participatory health research in Asynchronous Remote Communities (ARC)(MacLeod et al., 2017); and connectivist learning in Online UWC (Celina et al., 2016, 2020). In this chapter I conceptualise social media technologies as *material for design*, that is, as a raw material with which coordinated

⁷ Published version of this chapter: Daniel Lambton-Howard, Patrick Olivier, Vasilis Vlachokyriakos, Hanna Celina, and Ahmed Kharrufa. 2020. Unplatformed Design: A Model for Appropriating Social Media Technologies for Coordinated Participation. *In Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems (CHI '20)*. Association for Computing Machinery, New York, NY, USA, 1–13. DOI: <https://doi.org/10.1145/3313831.3376179>

participation is realized. Building from the insights generated in the design process in the previous chapter, the reviewed literature, and the exemplar projects examined in this chapter, I develop a model that proposes four material qualities of social media technologies, morphology, role, representation of activity and permeability (a refinement and maturation of the qualities identified during the design process of WhatFutures), and point to how they can be productively employed in the design of coordinated participation. This chapter concludes with a discussion of the implications of this model, and its pragmatic and descriptive utility, on research and software design in general.

4.1 Motivation Summary

As discussed in chapters 1 and 2, designing ways for citizens, stakeholders and communities to participate in projects is a key concern of organizations, institutions and researchers. The goals of coordinating participation (which this thesis defines as *the creation of processes, activities and tools that seek to engage people in working towards a particular goal*) are varied, yet they all face similar design challenges. At the same time social media technologies are increasingly being incorporated into every aspect of our lives (e.g. the use of WhatsApp for delivering court summons in India (Ohri, 2018), to patients using social media to track and report health conditions (Grajales, Sheps, Ho, Novak-Lauscher, & Eysenbach, 2014), to entirely self-organized groups within social activism (Crivellaro et al., 2014)). Furthermore literature introduced in chapter 2 shows the increasing prevalence of ad-hoc appropriated social media technologies in the real world. For example, Twitter as emergency response to earthquakes (Starbird & Palen, 2011), for volunteer led information management (Cobb et al., 2014) and for public engagement within non-profit organisations (Hou & Lampe, 2015). Similarly, the relative success of WhatFutures at engaging young global volunteers (compared to previous attempts by the IFRC that relied on bespoke technologies) further highlights the potential of designing the social structures and processes (e.g. governance) and technical infrastructures (e.g. aggregator websites) that build on top of existing social media technologies.

Despite the evident utility of appropriating social media technologies for coordinated participation, there is little understanding of how to actually do it. This is important, as ad-hoc appropriation practices are reported as being woefully under equipped to deal with real-world contexts (Vaida et al., 2011; Wiggins, 2013). This illustrates the need for a purposeful and systematic understanding of appropriation in the context of coordinated participation. An effective model will not only provide a more in depth understanding of appropriation, but it may also offer a compelling set of design opportunities, and make it easier for others to effectively exploit the potential of social media technologies.

The design process of WhatFutures demonstrated how my initial attempt at conceptualising social media technologies as design material offers a potentially productively way to design engagements with social media. However, the research context of WhatFutures was very specific, and it is unclear to what extent the concepts introduced in the previous chapter are applicable beyond that research context and/or beyond WhatsApp. In order to formulate a genuinely useful model for appropriating existing social media technologies for coordinating participation, a more systematic, holistic and contextually unhindered understanding of the design space is needed.

To this end, I look at three examples of the appropriation of existing social media technologies for coordinating participation, each in distinct domains: Asynchronous Remote Communities (MacLeod et al., 2017) (participatory health research), Online UWC (Celina et al., 2016) (connectivist MOOCs) and WhatFutures (participatory strategic foresight). These examples represent a broad range of domains, deployment scales and technologies, but are common in their attempts to democratically engage participants on the social media technologies that they are already using.

I propose a conceptualization of social media technologies as *design materials* with *material qualities*. In this chapter I focus on the utilization of these material qualities for enabling coordinated participation. This allows me to chart a design space, within which I surface how the design decisions of each case study have been *configured* (directly manipulated) and

augmented (added to or otherwise enhanced) the material qualities of social media technologies in support of coordinating participation. In contrast to prevailing tendencies to build new and bespoke platforms to meet the challenges of coordinating participation, I propose a model of *unplatformed design*. I refer to it as *unplatformed* in that it does not involve the creation of new platforms to sustain a process of participation, but rather utilizes the materiality of existing social media technologies.

4.2 Coordinating Participation with Social Media: Case Studies

My approach takes WhatFutures and two other examples of coordinated participation that share the common quality of being enacted through existing social media technologies. I scrutinize the design rationales behind each study in order to unpick design decisions, and examine reported reflections upon the benefits, limitations and general implications of designing on social media technologies. The full process of this analysis can be found in Appendix E.

I begin with a summary of each of the case studies to outline their key characteristics and the primary elements of their design. I also detail where decisions around the appropriation of social media technologies are specifically reported. Based upon insights from appropriation research discussed in chapter 2, and in order to ensure consistency in my approach, I then apply an analytical lens to each study. This lens focusses on a number of key factors identified in the literature and specific things to pay attention to:

- 1) *Tools* - the use of tools in respect to how each case study recruits, combines and coordinates different technologies in order to achieve a goal of coordinated participation (Dourish, 2003; Tchounikine, 2017; Dix, 2007; Gonzales et al., 2015).
- 2) *Activity* – the specific activities that participants are performing as part of the case study (Lee & Paine, 2015; Dourish, 2003; Wenger, 1998).
- 3) *Information Flow* – how information is introduced, disseminated, outputted from a case study (Gonzales et al., 2015; Turner et al., 2010)
- 4) *Social Structures* – how participants and researchers are organised in relation to each other and themselves (Wenger, 1998; Dourish, 2003; Tchounikine, 2017)

Paying attention to these four factors provides a consistent analytical lens with which to establish commonalities across the case studies. Following the account of the three studies, I then abstract and theorize as to these commonalities, the synthesis of which ultimately results in a presentation of the unplatformed design model.

I now summarise the following: Asynchronous Remote Communities (MacLeod et al., 2017), Online UWC (Celina et al., 2016) and WhatFutures. Although WhatFutures is presented in detail in the previous chapter, it is also summarised here for the sake of completeness and analytical consistency. Where further clarification was needed (e.g. when design specifics are not reported in published papers), I also consulted with the main authors of those papers. These case studies span a broad range of domains, social media technologies and scales of participation. Despite this all three are united by their resource constrained contexts of deployment and in their attempts to democratically engage participants on the social media technologies that they are already using, as opposed to (potentially unsuccessfully) migrating them onto new or unfamiliar technologies.

4.2.1 Case Study 1: Health Research with Distributed Populations, Asynchronous Remote Communities (ARC)

MacLeod et al. (MacLeod et al., 2017) developed the Asynchronous Remote Communities (ARC) research method in order to overcome limitations inherent to co-located and synchronous research methods used within traditional human-centered health research. ARC was designed to generate workshop and/or focus group qualitative data from communities such as pregnant women and new mothers (Prabhakar et al., 2017), teenagers experiencing stress (Bhattacharya et al., 2019) and people living with rare diseases (MacLeod et al., 2017), by communicating with them on a social media platform they are already using.

The ARC method brings together a group of participants in a digital environment (e.g. a closed and hidden Facebook group) to complete a set of assigned individual or collaborative activities. These activities are posted periodically within the group and include forms of traditional human-centred research methods such as lightweight ice-breaker activities, diary-

keeping, photo elicitation, persona development, as well as psychometric tests and surveys. Primarily participants post their text or image responses directly into the group, however other tools can also be employed to collect different types of data, such as bespoke survey tools for survey data and audio services (e.g. Google Voice) for audio recordings.

Through reflection on a series of deployments of the ARC method, Maestre et al. identify a series of lessons for the design of similar studies that use online platforms. For example, the importance of *'posting activities and reminders on the same day every week'* (Maestre et al., 2018) and, in a reference to the way some platforms (e.g. Facebook) curate what content is seen by users, Macleod et al. (MacLeod et al., 2017) observe that *'researchers should be prepared to adopt multiple approaches to ensure activities are seen by participants'*.

Perhaps most interestingly, Maestre et al. point to the ways in which studies that take place on existing platforms can be alternatively designed, and the reasons why researchers may want to do this (Maestre et al., 2018). Variables that they suggest may be altered include choice of platform (for reasons of data ownership, privacy, or features that simplify data analysis or allow for different kinds of interaction), activities and their frequency, study length, sample size and participant groupings and group size (to suit different research goals and populations). The importance of weighing up the 'pros and cons' when choosing platforms for ARC is further elucidated by Kresnye et al. (CassLe Kresnye et al., 2019)

4.2.2 Case Study 2: Connectivist Online Learning, Online UWC

Within the domain of informal education, Celina et al. (Celina et al., 2016, 2020) designed a series of connectivist open online courses in collaboration with United World Colleges (UWC), that used existing social media platforms as central infrastructure for the learning activity. Their stated intention was that this infrastructural approach would enable participants to democratically select their preferred communication channels in support of their autonomy as learners. This would reduce the risk of a central structure, or locus of teaching, pre-determining learning pathways and constraining innovation, as well as lowering any technological barriers to participation.

Celina et al. ran three courses under the umbrella of Online UWC, one based primarily through ‘loosely-coupled’ social media (Celina et al., 2016). These courses used Google Course Builder as a central website for course scheduling and materials, and relied on a loose ecosystem of social media (Facebook, Google+) messaging and communication platforms (WhatsApp, Skype, Google Hangouts, email) for discussions and group activities. The learning was assisted by assigning participants to particular roles: mentors who helped students understand the material; student chairs who led and directed group discussions; and course coordinators who helped with logistics and timings. As well as these formal roles, the courses also placed a particularly strong emphasis on self-organization by students.

Infrastructuring the courses in this way was found to increase overall engagement, particularly in respect to promoting community, as many of the groups created during these courses persisted after the course had concluded. However, Celina et al. noted the challenges of providing clear and unambiguous communication to participants about logistics and learning expectations when no central platform was used and particularly when working at scale across multiple platforms.

Celina et al. also reflected upon the different usage patterns between a bespoke learning platform, LearningCircle.io (Celina et al., 2018, 2020), and usage patterns on loosely-coupled social media technologies. They concluded that *“using a variety of platforms that are natively used by learners can more prominently and naturally lead to the creation of lasting social bonds that survive the course... A ‘platform’ for a connectivist inspired course should integrate and organise [social] media, not aim to displace it.”* (Celina et al., 2018)

4.2.3 Case Study 3: Strategic Foresight, WhatFutures

In 2017, the International Federation of Red Cross and Red Crescent Societies (IFRC) sought to engage their global young volunteers in a large-scale, participatory, strategic foresight activity. The IFRC had historically struggled to engage this populations with traditional survey methods, and so, in collaboration with myself, designed and delivered WhatFutures, a 10-day online engagement event, WhatFutures employed the messaging application WhatsApp to

gather rich qualitative data in support of the IFRC's strategic project to develop a 10-year strategy. WhatsApp was chosen as the primary method of engagement due to its widespread use in the developing world, particularly by young volunteers in resource constrained contexts.

As described in the previous chapter, WhatFutures was designed to be an engaging small team game event, where teams of participants would respond to creative challenges. These included producing news stories about a challenge facing their society in 2030, and recording audio and video messages to the general secretary of the IFRC about an innovative response to a crisis in 2030. To support understanding of the complexity of global issues, each participant chose a unique role to play in their team (*environmental scientist, cultural expert, technologist, political advisor*). These roles, and corresponding identity and team duties, were further constructed through an interlinking system of WhatsApp group chats (see figure 1 in chapter 3). In these chats, participants would have access to a large group of others who shared the same role, but were from different teams. As data from WhatsApp groups cannot be automatically exported, Administrators (named 'Future Guides') were also in each team, and assisted in the exporting of multimedia data to a shared Google Drive and posting the game's challenges in the form of image files. Updates were then posted on an external website 'leader board', where each team could view and comment on all the responses to the game's challenges.

Chapter 3 details the results of the WhatFutures pilot that took place in June 2017 with 5 countries, and 487 participants generating 95 multimedia artefacts and over 16,000 messages in support of IFRC's strategic foresight project. Reportedly, "*the game was highly successful at attracting a diverse audience directly and maintaining a substantive dialogue, an outcome that most other previous attempts have failed at.*" This is attributed '*primarily to the utilization of a popular existing communication service that was familiar to the intended player base*' – significantly lowering barriers to participation.

In the process of designing with WhatsApp, I identified four qualities of the social media technology: *morphology*, *role*, *externalisation* and *process*. Respectively, these referred to connections between users, a user's functions within a system, representation of data outside of a system, and the rules that structure a process. It is these relatively undeveloped concepts that I use as a starting point for the model of unplatformed design.

4.3 Thinking Materially

Through examination of these case studies, I identify commonalities in respect to how they recruit, combine and coordinate different technologies, as well as how they construct and support specific social behaviours and practices. These commonalities exist, despite the variety in modes of participation, due to the need to democratically engage participants in resource constrained contexts. To help formalise these commonalities into a useful model, a core element of this abstraction is to conceptualise social media technologies as *design material*. This establishes a consistent approach in the abstraction that eschews typical understandings of social media technologies and their ingrained usage patterns, and enables us to see more clearly how they have been appropriated. Although this conceptualisation began in the previous chapter with the design process of WhatFutures, I now revisit it more comprehensively and describe exactly what is meant by *design material*. In this way, this chapter details a maturation of the concept as it occurred through my research.

The conceptualization of digital technologies as material has history within HCI, most notably in Löwgren & Stolterman's "*Thoughtful Interaction Design*" (Löwgren & Stolterman, 2004) and Eli Blevis' "*Regarding Software as a Material of Design*" (Blevis et al., 2006). Whereas these works sought to situate software as a material product *of* design, and therefore warranting of an appropriately rigorous design process and designerly evaluation (arguably now an established perspective), my conceptualization instead positions social media technologies as material *for* design, that is, as the raw material with which something else is realized – namely coordinated participation.

My use and understanding of materiality follows Dourish (Dourish, 2017) who described the materiality of information as “*those properties of representations and formats that constrain, enable, limit and shape the ways in which those representations can be created, transmitted, sorted, manipulated and put to use – properties like robustness, consistency, compressibility, malleability...*”(p26) Or to put it bluntly, the way information is materially configured ultimately affects what we can do with it. Just as it is useful for a carpenter to understand how the material qualities of a piece of wood (grain, hardness, pliability etc) affect the qualities of the final table, so it is useful for designers of coordinated participation to appreciate how the material qualities of social media technology (e.g. how information is presented, how connections are formed between users) will impact on the activities and processes they seek to coordinate with those technologies.

Similarly, just as it is important to understand the qualities of the material you are working with, it is also important to understand the operations that can be applied to it. To this end, my examination of the case studies uncovered three broad categories of operations that manipulate or add to the material qualities of social media technologies: *configuration*, *hard augmentation* and *soft augmentation*.

Configuration: Refers to the arrangement and combination of elements intrinsic to a social media technology, (e.g. the use of a private Facebook group in ARC, WhatsApp groups in WhatFutures). In each of these case studies, decisions have been made to manipulate the base material of an adopted social media technology (e.g. using the group function on a messaging application to create teams, disseminating information by using the upload function etc). I refer to these set of design decisions as *configuration*, as they refer to the direct manipulation of elements intrinsic to media technologies. This is in line with current theory which views the active configuration of technical infrastructure as being a crucial component to the work of appropriating technologies (Stevens et al., 2009).

Hard augmentation: Refers to the introduction and combination of additional technologies to social media technologies. The case studies bring to light a design space that exists beyond

the boundaries of the technical infrastructure of the adopted social media technologies (beyond configuration). For example, both Online UWC and WhatFutures involved the creation of an external website to facilitate resource sharing and public presentation respectively, whilst all three case studies employed a small set of tools to facilitate the capturing of data. These effectively act as extensions to the base material of the adopted social media technology within the context of the coordinated participation. To revisit the analogy of making a wooden table, I see these as the addition of other materials to improve the overall design, such as the inclusion of metal supports or application of protective lacquers. In contrast to configuration, I refer to these set of design decisions as *hard augmentation*, in that they enhance and expand upon the base material with additional material.

Soft Augmentation: Refers to the establishment of agreed practices and social behaviours (e.g. student mentor roles in Online UWC, Future Guides in WhatFutures). Beyond considerations of technical infrastructure of the case studies (configuration and hard augmentation), we can also see a set of design elements that are entirely social in nature (e.g. divisions of labour and expertise, establishing of norms, and the setting of procedures and tasks). To understand these I revisit the concept of ‘practice’ from Wenger’s communities of practice (Wenger, 1998). Wenger states that *‘practice is, first and foremost, a process by which we can experience the world and engagement with it as meaningful’*. This is useful to us, as it helps surface the design elements in these case studies that establish the ‘practice’ of the coordinated participation. For example, the communication work that transforms a particular Facebook group into a health research study with an established set of behaviours and responsibilities; or that turns a WhatsApp group into a competitive team; or, to push the analogy further, that tells us that a chunk of wood with four legs is either a dinner table or a work desk. I refer to these set of design decisions as *soft augmentation*.

In summary, there is a distinction between the **configuration** of material (the arrangement and combination of elements intrinsic to a social media technology, e.g. the use of a private Facebook group in ARC), the **hard augmentation** of material (the introduction and

combination of additional technologies, e.g. the external aggregator website in WhatFutures), and ***soft augmentation*** of material (the establishment of agreed practices and social behaviours, e.g. student mentor roles in Online UWC).

In order to understand in detail, the ways in which configuration and augmentation of material has occurred within the case studies we need a more nuanced understanding of materiality. To this end I revisit my earlier conceptualization of the materiality of social media technologies as consisting of distinct *material qualities*. These material qualities provide a level of explanatory granularity that is lacking from more general descriptions. In the previous chapter, I proposed an initial categorization of material qualities of WhatsApp (morphology, role, externalisation and process). It is these concepts that I now revisit, adapt and build upon in relation to coordinated participation.

In revisiting these initial qualities, I have decided to not include 'process', as its temporal dimension makes it conceptually distinct to the other material quality. As such I will now discuss it separately. Furthermore, upon examination of the case studies, I do not consider 'externalisation' as a useful quality to the model as it is a relatively undeveloped concept that referred more specifically to how information is outputted from WhatsApp. Instead I propose two new qualities. The first, *representation of activity*, refers to how information is represented generally (following Dourish) both internally and externally. The second, *permeability*, is based on my reflections of information flow within the case studies and concerns the ways in which data and information are transferred within a coordinated participation.

In summary I have identified and refined four primary material qualities of coordinated participation through social media technologies: ***morphology, role, representation of activity*** and ***permeability***. Using these material qualities as the basis of our understanding, I now present evidence gathered from the meta-analysis of three empirical case studies introduced earlier, and discuss the ways in which these qualities have been configured and augmented in support of coordinated participation.

Morphology	ARC	Online UWC	WhatFutures
Configuration	Number of groups: typically 1-3 Group size: ~15 Relationship between participants: group membership	Number of groups: dynamic Group size: 2-10 average Relationship between participants: dynamic, group membership	Number of groups: ~100 Group size: 4-8 average Relationship between participants: group membership
Hard Augmentation	Email recruitment for participants	Central website (Google Course Builder / Bespoke Website) Google Hangouts and assignments Private Facebook groups	Central website Shared Google documents between administrators
Soft Augmentation	Building of strong connections between researcher and potential participants pre-recruitment	Students sharing contact information	Administrative rules creating a 'hierarchy' of groups

Table 3. Configuration and augmentation of *morphology* in the three case studies

4.3.1 Morphology

A core characteristic of social media technologies is the realization of sociality through connections and relationships between users. Borrowing this term from biological sciences, the material quality of *morphology* refers to the overall form and structure of these connections when viewed as a whole. These include, but are not limited to: *group membership; group size; number of groups; friend relationships; following relationships and number of relationships.*

As the nature of these connections differ, so do their implications on the interactions that take place on, and with, that system. Consider for example, the different available actions,

and nature of interactions, between being in a group chat (e.g. WhatsApp), to being a ‘follower’ of someone (e.g. Instagram). In turn, size, membership criteria, and connectedness of groups characterize the qualities and dynamics of interactions between participants. This is of relevance to coordinated participation as the size and membership of groups has implications on factors such as mutual understanding, group cohesion, and capacity for decision making (Kamel & Davison, 1998; Lowry et al., 2006). Additionally, connections between groups and individuals, realized through overlapping membership, may be a channel through which information and knowledge diffusion can occur (and can be influenced).

If we look at the morphologies of the case studies, we can shed light on the design features of the three systems and also elaborate on how the quality of morphology can impact on the coordination of participation. Table 3 shows how the case studies have *configured* the morphology of their adopted social media technologies. Compare ARC with WhatFutures, where the former typically configures between one and three groups (Prabhakar et al., 2017; MacLeod et al., 2017; CassLe Kresnye et al., 2019) as the locus of participation, (due to its relatively small participation size and sensitive subject matter), the latter configured multiple small independent WhatsApp groups (to facilitate competitive, team-based challenges).

Beyond this configuration of connections intrinsic to social media technologies, we can also see connections that occur externally. In Online UWC connections were made in the form of multiple private Facebook groups where learners discussed assignments. The administrators and organizers then *hard augmented* connections between these groups with a central scheduling website. These augmentations were not manifest in the Facebook groups themselves, but still constitute the overall morphological form of Online UWC.

In WhatFutures, I imposed a ‘hierarchy’ of information and responsibility on top of WhatsApp groups. Some groups were specifically designated for administrators, with an organizer’s and stakeholder’s group above this. This hierarchy was not a configured aspect of the system, but instead was a soft morphological augmentation sustained by the organizers and

administrators within those groups, and affected information flow and activity throughout the coordinated participation.

Role	ARC	Online UWC	WhatFutures
Configuration	Administrative rights: group administration restricted to researchers Authorial permissions: open to all	Administrative rights: dynamic, negotiated between participants Authorial permissions: open to all	Administrative rights: group administration restricted to game facilitators and organizers. Authorial permissions: open to all
Hard Augmentation		Administrative rights on central course website restricted to organizers of Online UWC	Editing rights of shared Google Drive documents restricted to research team
Soft Augmentation	Research participant privileges and expectations Researcher role	Mentor role Student chair role	Player specialisms (environmental, cultural, political, technological) 'Future guide' administrator role Game master role

Table 4. Configuration and augmentation of *role* in the three case studies.

4.3.2 Role

The material quality of role concerns the communication, understanding and designation of a user's identity and understanding of the actions, duties and expectations related to that identity. For social media technologies, this is most often expressed through the implementation of a model of access and control. Examples of this include, but are not limited to *administrative roles*; *authorial permissions* (who 'owns' media); *commenting rights*; *moderation roles* and *direct messaging rights*.

Role is relevant to coordinated participation as it can be a powerful mechanism for scoping anticipated contributions of both participants and groups, and make expectations concerning

division of labour explicit (Cohen & Lotan, 2014; David W. Johnson & Johnson, 1999). Role can also be understood through divisions of expertise (e.g. who is suited for what tasks) and divisions of perspective (e.g. different disciplinary traditions) to name two examples. The quality of role is also affected by different distributions of power, disparities in information and societal expectations. In the case studies these differences, more often than not, were intended, and naturally affect the functions and actions that people perform (Giles et al., 2010).

Again, by looking at *role* in the case studies we shed light on the design features of the studies and on how the quality of role has been employed in coordinating participation. Table 4 shows how the case studies have configured role. Compare WhatFutures and ARC, where administrative privileges were restricted to researchers and coordinators (in order to ensure continued control over respective projects), with Online UWC, where group creation and administration was negotiated between participants (in support of the ideals of a connectivist MOOC).

In the case studies, the *hard augmentation* of role occurred when access permissions need to be controlled for external technologies, such as Google Drive permissions in WhatFutures and central website administration in Online UWC. However, the most effective manipulation of role in respect to coordinated participation can be found where it has been *soft augmented*. In WhatFutures, the system-level designation of WhatsApp group administrator (and the associated system privileges that affords) was soft augmented with the role of 'Future Guide'. The Future Guide role communicated an expectation of conduct, expertise, a duty of care, and a set of procedural responsibilities with respect to the transfer of information and media.

Furthermore, I created four additional roles in WhatFutures to express different types of expertise. These roles were assigned externally to WhatsApp, and had no distinction at a system level. Nevertheless, they acted to support the division of labour within group activities, to provide multiple perspectives on complex issues and to support the overall morphology of the unplatformed design (role was used to determine group membership). A

similar approach was adopted by Online UWC where student chairs and mentors were assigned to lead discussions and learning. Within ARC, the identity of participants was explicitly soft augmented with the role of being a 'research participant', and so was accompanied with requests for consent, and the communication of the associated 'privileges' of being able to leave the study at any point and general rules around conduct/participation and data capture.

4.3.3 Representation of Activity

Representation of activity is the manner and methods by which the activity of participants is presented, curated and navigated, either within a social media technology or externally. By activity I am referring to the products of participants' interactions with each other and the system, such as posts made on Facebook, media uploaded to WhatsApp, tweets and direct messages. By representation, I am adopting Dourish's (Dourish, 2017) assertion of representation of information as not being merely abstract, but as having critical consequences for what we can do with it (e.g. sort, transmit, navigate, comprehend and otherwise manipulate). Examples of system level configurations of representation of activity are multitudinous, and include (but are not remotely limited to): *choice of media type; message threading; media interactions* (e.g. likes, follows, favourites, retweets etc); *tagging/categorization of media; curation of activity* (e.g. pinning posts, discovery algorithms); *Visibility of media (private → public)* and *persistence of media*.

For coordinated participation, decisions around how, when and whether activity is made visible may drive behavior, knowledge exchange and a sense of collective action or competition (as in WhatFutures). Consider the difference between a direct timeline of messages (e.g. WhatsApp) compared to threaded replies and comments (e.g. Facebook group). The former is more facilitative of 'in-the-moment' messaging and focusses conversation towards one narrative as multiple conversations become hard to follow in a group. Threaded conversations are easier to follow but evoke a sense of fragmented activity that can be difficult to manage in complex tasks (Johansen, 1988).

Representation of Activity	ARC	Online UWC	WhatFutures
Configuration	Choice of media type: activities primarily posted as text Visibility of media: private Curation of activity: pinned activities	Choice of media type: video discussions, text posts and images Visibility of media: private within group activities and within Facebook groups	Choice of media type: primarily text, but image used for challenges and image and video solicitation. Visibility of media: private within WhatsApp group chats
Hard Augmentation	Mobile application prototype (in (Maestre et al., 2018))	Central focal point website, used for scheduling and organization	Central focal point website, used for leader board and further engagement
Soft Augmentation	Activity post titles marked as [ACTIVITY] to improve visibility		Curation and selection of participant activity for public and other participants

Table 5. Configuration and augmentation of *representation of activity* in the three case studies.

Features that allow the navigation and surfacing of historical activity (e.g. through search functions, tags, or otherwise) have an effect on the potential complexity of collaborative tasks. They may support or inhibit the ability of users to manage large amounts of information and multiple sources (Johansen, 1988). Similarly, curation of activity, referring to decisions around which activity to make visible (e.g. the order of posts on a Facebook timeline) is also an important factor and is particularly relevant when curation is performed by oblique algorithms that decide the primacy of pieces of activity and flag them as popular, relevant or neither (MacLeod et al., 2017).

Table 5 shows how the three case studies *configured* representation of activity and how these relate to the coordination of participation. In ARC, activity was posted within a Facebook group where participants could engage at their own pace without worrying that content might disappear completely or be hard to find later. This supported the overall flow of the

study and enabled the social media group to act as a repository for the participants' activity. This is contrasted with Online UWC, where the primary activity was live discussion. Often held through group video conferencing, this led to a more dynamic and impermanent representation of activity. Although the accompanying use of Facebook groups (for more organizational conversations) provided a more permanent and navigable account. An example of configuration of media type can be found in WhatFutures, I chose to represent the game's three challenges as image files (as opposed to text) so they were more easily identifiable and more easily forwarded between team groups.

In the case of both Online UWC and WhatFutures, representation of activity was *hard augmented* by the creation of an external website, acting as a permanent (and public) focal point, and enabling further commenting and activity. This choice has clear implications on the visibility and scope of coordinated participation. Within WhatFutures this enabled a perception of scale, of taking part in a project with large numbers of participants, and reportedly increased engagement and commitment to participation (McGonigal, 2011).

Although the public display of participant activity runs counter to the goals of ARC, representation of activity was *soft augmented* within their Facebook group by manually writing '[ACTIVITY]' in the title of posts that contained important research activities. This was to improve the visibility of these posts so that they stood out from general posts. Note that visibility of posts was also configured by using the 'pin post' functionality to increase prominence.

Permeability	ARC	Online UWC	WhatFutures
Configuration	Researchers used standard Facebook input methods.	Video conferencing functionality of Google Hangouts Facebook groups	'Export chat' for outputting data Administrators used standard WhatsApp input methods.
Hard Augmentation	Google forms / Survey Monkey for gathering survey information	Use of loosely-coupled tools and central website for scheduling, tracking attendance, assignment completion and feedback	Shared Google Drive for outputting multimedia data Central website used for gathering participant recruitment data
Soft Augmentation	Data 'collected', through manual copying and pasting of Facebook interactions.	Use of mentors in prep/delivery Creation of class materials to support discussions	Administrator scheduled posting of pre-prepared information (challenges and deadlines)

Table 6. Configuration and augmentation of permeability in the three case studies

4.3.4 Permeability

The quality of permeability refers to the ways by which a system can receive, output and exchange information with users and other systems. As coordinated participation usually involves the transmission and collection of information and data in support of its goals, the ease in which this information flow can be enacted (i.e. how permeable a technology is) has significant implications for how it can be used to coordinate participation. Examples of system level configurations of permeability include, but are not limited to: *methods of posting information or uploading media; methods for downloading content and media; formats of outputted data; availability and usability of APIs and in-system analytics.*

For coordinated participation, the ways in which a system allows information to be input is a relevant concern. Manually entering information may make sense in smaller studies but quickly becomes impractical at scale. The availability of an API that allows the automated or bulk distribution of information then affects the design of a coordinated participation. The method of input also affects the quality of that communication. Automated or bulk

communication has a different character to human inputted communication, and this will in turn affect how it is perceived and engaged with by participants (Hill et al., 2015).

Coordinated participation projects generally have a requirement to collect and analyse data. Interfaces that allow the output of information are therefore also of concern. Again, the availability of an API that can facilitate automated collection of information and data, (e.g. through scraping) can support data collection practices at scale. Likewise, the formats in which information and data can be collected and represented (e.g. raw text or formatted .json) change what can be done with it and so may entail different approaches to analysis and the introduction of external tools and software.

Related to both these concerns are the ways in which a social media technology interfaces with other systems. The more easily that information can be transferred between systems the more likely it is that external tools can be effectively employed. Celina et al. explored this idea in (Celina et al., 2016), and proposed the concept of ecosystems of systems as existing on a spectrum between being 'tightly-coupled' media (where systems interface through APIs) or 'loosely-coupled' media (where transfer of information between systems is performed by human operation, such as copy paste and manually downloading and uploading files).

Table 6 shows how permeability has been configured in the case studies. In each case the standard input methods of their chosen social media technologies were used for posting information and activities. The lack of a WhatsApp API led to WhatFutures using a team of administrators (Future Guides) for communicating with participants. This can be contrasted with ARC where standard input methods of Facebook were suitable for the smaller scale. Both Online UWC and WhatFutures augmented permeability by using a small collection of support tools for organizational communications, scheduling information and resource and data sharing. In ARC, Facebook data was manually collected, by copying and pasting into external documents, an example of *soft augmentation*.

4.4 Process and Coordinated Participation

One aspect that is absent from the descriptions of the material qualities of social media technologies is *time*. One of the defining characteristics of social media technologies is that they are constantly changing: timelines are updated in real-time with new content, friend connections are made and broken, posts are made and deleted, groups are formed and disbanded. Although it may seem that the descriptions of the material qualities of social media technologies in the previous section represent static things, in reality they are occurring in time. This temporal factor cuts across decisions around the configuration and augmentation of material qualities. It relates not just to what is configured and augmented, but also to when.

In the previous chapter I initially identified *process* - referring to decisions around when things should occur in a coordinated participation - as a material quality. However, in this chapter rather than treating process as a distinct material quality, it is clear instead that it refers to the temporal characteristics of the configuration and/or augmentation of the material qualities. In this way, we can see that decisions around when such operations should occur are ultimately made to support the overall process of coordinated participation. That is to say, the temporal manipulation (whether configuration or augmentation) of the material qualities of a social media technology is how a process of coordinated participation is enacted on that technology.

To illustrate this, we can look at specific examples of temporal design decisions from the case studies. Morphology, for example, was constantly dynamic within Online UWC, ebbing and flowing according to the needs of participants as they engage in activities related to assignments. In respect to WhatFutures, the large conference WhatsApp groups in WhatFutures were not 'opened' until after an initial icebreaker period. Here the morphology of the engagement was changed over time to introduce complexity at a manageable rate for participants. This is a deliberate change in the material quality over time, that supports the goals of the coordinated participation (namely engagement).

In the case studies, other material qualities changed over time, for example, participant assignment to a role in Online UWC changed between assignments in order to expose participants to different student mentors. Challenge outcomes within WhatFutures were published on the game's leader boards (an external representation of activity) at discrete points in time. Permeability, in respect to the posting of information, was tightly bound to a schedule with ARC, in order to create a suitable pacing of activities and expectation of contribution for participants. These examples show that the scheduling, duration or otherwise temporal characteristics of the configuration and augmentation of material qualities are a crucial consideration to coordinating participation with social media technologies.

Furthermore, these examples point to the intimate connection between the *process* of coordinated participation (e.g. activities, work, communication, collaboration) and these temporal characteristics. Meaning, that decisions as to when configuration and/or augmentation should occur are primarily informed by an external understanding of participation domain (e.g. health focus groups in ARC, online learning in Online UWC and future foresight workshops in WhatFutures). The implication of this is that no decision to configure and/or augment a social media technology can be divorced from temporal considerations, and that in turn, these decisions are ultimately an expression of the activity domain of the coordinated participation.

4.5 Discussion

4.5.1 The Implications of Thinking Materially

Social media technologies that have been adopted on a global scale, have been designed and optimised for specific usage patterns. Business models, underpinning these designs, take account of patterns of adoption, revenue generation and retention of users, etc. These patterns are often manifestly explicit, such as specific prompts for engagement and sharing of content, but also implicit, baked into the design of interfaces and algorithms themselves. They are hard to break away from, but thinking materially through the model presented here,

allows us to frame them in new ways, effectively opening up a large, and until recently, relatively unexplored design space. My intention behind this model is not to provide recommendations for how to design participation but rather to draw attention to new resources for design. As such I make the claim that the model presented here has *descriptive utility* and *pragmatic utility*.

The *descriptive utility* of the model is apparent in how the material qualities of the model, and the operations that can be applied to them (configuration and augmentation), allow us to isolate facets of existing systems that are difficult to describe without this conceptual apparatus. Indeed, when reflecting upon the case studies, what may have at first appeared to be three interesting but not essentially related systems, can now be seen more clearly as a set of designs based upon the materiality of social media. Crucially, this allows us to not only understand why design decisions have been made, but it also gives us a language to talk about them, to understand who made the decisions, for what purpose and to potentially identify why some decisions may be more or less successful than others in coordinating participation.

The *pragmatic utility* of thinking materially is in its value as a 'sensitizing concept' (Blumler, 1954), an interpretive device that draws attention to the qualities of technologies that can be employed in design. Practically speaking, this will allow designers to reflect more clearly on the qualities of social media technologies not only in their suitability to a particular project (e.g. (CassLe Kresnye et al., 2019; Dimond et al., 2012)), but also to be able to identify new possibilities as to how these qualities can be configured more effectively, augmented with external tools and software, or enhanced and coordinated through social processes. A first step in designing participation could be to identify which existing social media technologies are being used, and how these might be configured to support the goals of that participation. Thinking in this way makes it easier to perceive how a messaging application may be repurposed as peer support infrastructure and/or employed as data capture for a health intervention, or alternatively reconfigured as dynamic, low-tech communication hierarchy for volunteers responding to a crisis, to name just two examples.

Further exploration of this design space may also have implications on the design of social media technologies themselves. As unanticipated usage patterns and shortfalls of technologies are identified, social media technologies are modified to meet them. We can see this with Facebook's creation of specific health groups (Lovett, 2019) with increased privacy controls and WhatsApp Business App (WhatsApp, 2019) for increased options for tailoring and automation. Similar to how research around designing for appropriation (Dourish, 2003; Dix, 2007; Tchounikine, 2017) leads to a practical understanding of the elements of software design that lead to greater user customization, material understandings of social media technology may lead to them being designed with these material qualities in mind. This may entail changes to application infrastructure to better facilitate combination with external tools, or the creation of new flexible ways for users to communicate and coordinate social processes within technologies.

4.5.2 The Implications of Configuration and Augmentation

Configuration and augmentation, the operations performed to manipulate the material qualities of social media, are key elements of the model. But when is it best to configure and when is it best to augment a material quality? From the case studies we have seen that these decisions are in general based upon what best meets the functional requirements of a process, e.g. input and/or output of data, scheduling of activities, designation of roles. This is best expressed as the maxim '*configure as much as you can, and augment the rest*'. This represents the perspective of making the most effective use of the available features of a social media technology, in that augmentation is used when certain desirable features are not available or are otherwise limited on a technology (e.g. the lack of export functionality necessitating manual capturing of data in all three case studies). But it also occurs when certain processes are sustained through social factors (e.g. the use of mentors and administrators in Online UWC and WhatFutures).

In this way, we can see that augmentation can occur at the *boundary points* of technologies. The implication of this, to borrow from ubiquitous computing, is that augmentation can be

considered as an opportunity for *seamful design* (Chalmers & MacColl, 2003). Referring to the inevitable moments of failing (or the 'cracks') in interactions between ubiquitous computing devices, the notion of seams is a useful one to us. It has led researchers to propose that instead of trying to 'paper over' them, seams should instead be perceived as opportunities to *'increase the awareness for system infrastructures, their heterogeneous components and otherwise neglected yet useful information within the system.'*(Broll & Benford, 2005) with Mark Weiser calling for the design of systems with *'beautiful seams'*(Weiser, 1994).

Relating this to the model presented here, augmentation should not be seen only in terms of overcoming the technical limitations of social media technology, but should instead be seen as an opportunity to improve and gain more control over a process of coordinated participation. Upon reflection, examples of this can be seen in WhatFutures, where the hard augmentation of an external website (initially intended to overcome a technical limitation of WhatsApp groups being unable to view each other's activity) provided an opportunity to improve the engagement through the creation of a publicly viewable leader board, increasing engagement levels and motivation.

In particular, the soft augmentation of 'seams' is a good way of improving a coordinated participation. For example, in Online UWC issues arising from unpredictable student attendance were more easily solved by the flexible and socially negotiated distribution of mentor and student chair roles, than if they were hard augmented or configured, i.e. being enforced at a system level. Furthermore, in WhatFutures the technical limitation of being unable to automatically export data from WhatsApp groups necessitated the inclusion of a dedicated human in each WhatsApp team to manually perform this duty. This presented an opportunity whereby this apparent 'seam' could instead be enhanced into an administrator role and improve the overall process by providing additional support for participants by answering questions and becoming an ambassador. It would be remiss however to not acknowledge some of the general disadvantages of designing with existing social media technologies, particularly in respect to issues around ownership of data, privacy, security and

the potential for key features to change or be removed. The significance of these issues will vary between contexts, but should be considered in the design of coordinated participation.

4.5.3 Unplatformed Design: from Prototype to Product

Unplatformed design allows researchers an approach to coordinating participation that is robust, high fidelity and scalable. In this way, it can be seen as a step from designing research prototypes, to creating ‘finished’ artefacts. The model presented here is the natural next step of work in HCI that has begun to explore the potential benefits of incorporating social media technologies into prototyping new technologies. Grevert and Gilbert (Grevet & Gilbert, 2015) developed the concept of ‘Piggyback Prototyping’, incorporating existing large-scale social computing systems into a prototyping workflow. The method allowed researchers to overcome the barrier of achieving a critical mass of users needed to effectively prototype new social computing systems, by simulating interactions on an existing social media technology. The example they provide uses a Twitter bot to prompt potential social connections between geographically proximate passengers waiting in an airport.

Similar to the case studies examined in this paper, piggyback prototyping involves designers focussing their efforts on designing interactions and processes, within the material constraints of an existing social media technology. However, whereas piggyback prototyping uses generated insights to inform the design of a new technology, the model presented in this paper instead suggests that these designed interactions and processes can in fact be a design’s ‘final form’ and not a prototype. This is consistent with Odom et al.’s (Odom et al., 2016) call to move from research prototypes towards research *products*. Odom et al. argue that as the focus of HCI expands to investigate complex matters of human-technology relationships, designers must necessarily move from prototypes (which by definition are placeholders for some future thing) towards research products (as finished objects in their own right). This shift focuses the area of study from the *potential* of some designed thing to the study of what it *actually is* and how people actually interact with it, arguably a more accurate and authentic area of study of human-technological relationships.

Taking this further, each of the case studies in this chapter demonstrates an example of research responding to a real-world need. From ARC's gathering of real information to inform medical awareness of living with rare diseases (amongst others); to Online UWC's genuinely sustainable online course for United World Colleges; to WhatFutures meaningful inclusion of young volunteer's voices in the strategic planning of an international humanitarian organisation, all were forged in the heat of real need. On reflection, this is no accident, as designing coordinated participation on existing social media technologies gives research an opportunity to engage with real world problems, in high fidelity and at scale. In this way, unplatformed design can be leveraged by collaborating organisations to work at scale, particularly in contexts that are resource constrained or where the barriers of participation need to be lowered (e.g. NGOs, developing contexts, distributed populations).

4.6 Chapter Summary

In this chapter I have presented the central contribution of the thesis, the model for unplatformed design. The model consists of a conceptualization of social media technologies as design material, with four material qualities *morphology*, *role*, *representation of activity* and *permeability* and the ways in which they can be manipulated through *configuration*, *hard augmentation* and *soft augmentation*. I have demonstrated the utility of this model from an investigation of three case studies of coordinated participation, including WhatFutures. I have also pointed to the implications of unplatformed design as drawing attention to new resources for design around the appropriation of existing social media technologies, which may have ramifications on both the design of these technologies and on the design of coordinated participation going forward.

I argued that the model presented in this chapter has both descriptive utility, and pragmatic utility. The *descriptive utility* of the model has been clearly demonstrated within this chapter, consisting of the creation of new language that specifically describes both the qualities of social media that may be manipulated and employed in the coordination of participation (morphology role etc), but also a typology of operations available (configuration, hard

augmentation and soft augmentation). These terms allow fine grained description of the design decisions (and consequently design space) of this genre of system design, which was not possible before. In the discussion section of this chapter I argued that the *pragmatic utility* of this model consists in it being a sensitizing concept, an interpretive device that draws attention to the qualities of technologies that can be employed in design, and makes it easier for a designer to identify new possibilities as to how these qualities can be configured and augmented in support of coordinated participation.

It is to these two claims to utility that the following chapters now seek to explore, through the practical application of the model in two different research contexts. The intention behind this is threefold. Firstly, to investigate and hopefully validate the utility of the model in its use in design processes; secondly, to provide practical guidance on how it may be used to inform design processes for coordinated participation; and thirdly, to reflect upon and refine the model in light of its use in a real world context. Accordingly, the next chapter describes a full account of an unplatformed design process, deployment and evaluation of a peer support system for extreme weight loss as part of diabetes management. This account includes both direction and reflection upon the use of the model within that research context. Chapter 6 describes an account of a series of design workshops for the creation of a social media-based system for modern language learning. Here the account looks at the use of the model in exploring a more fine-grained understanding of social media use within an educational context.

Chapter 5 Blending into Everyday Life: Designing a Social Media-Based Peer Support System

In this chapter I give an account of the application of the model for unplatformed design proposed in the previous chapter. A version of this chapter has been accepted for publishing in *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*⁸. This chapter includes a full, detailed account of a design process for a social media-based peer support system for a community focused weight-loss initiative aimed at reversing or preventing diabetes in adults. The work described in this chapter takes place within the context of a wider health study, the Barbados Diabetes Reversal Study 2 (BDRS2). The design process itself spanned 3 phases, each informing the next. The first phase took place before my involvement in the study and consisted of an initial focus group for needs elicitation and context gathering; phase 2 consisted of a series of training and design workshops; and phase 3 consisted of the design, deployment and evaluation of the peer support system and accompanying materials. Each phase of this process was heavily informed by the unplatformed design model described in the previous chapter. It is used within the design process in both a *descriptive* capacity and a *pragmatic* capacity, and as such, constitutes a primary example of a practical application of the model.

I argue that the unplatformed design approach taken in this study, led to the creation of a social media-based peer support system that *'blended into everyday life'* whilst supporting the expression of varied types of social support. From a series of evaluation workshops, I demonstrate how using an existing, widely adopted, social media technology for peer support

⁸ Published version of this chapter: Daniel Lambton-Howard, Emma Simpson, Kim Quimby, Ahmed Kharrufa, Heidi Hoi Ming Ng, Emma Foster, Patrick Olivier. 2021. Blending into Everyday Life: Designing a Social Media-Based Peer Support System. In *Proceedings of CHI Conference on Human Factors in Computing Systems (CHI '21)*, May 8–10, 2021, Yokohama, Japan. ACM, New York, NY, USA <https://doi.org/10.1145/3411764.3445079>.

created an environment for authentic and naturalistic peer support to occur, whilst also being tailorable to participant's individual capacities and the needs of the community as a whole. I then reflect upon the unique characteristics of the unplatformed design model and its application within this process, to identify how it contributed to the creation of this peer support environment. Finally, I conclude with a discussion of the potential for the application of unplatformed design model in other contexts and with other communities. This discussion is continued and expanded on later in Chapter 7.

5.1 Related Work

5.1.1 Digital Peer Support

Peer support is widely recognized as improving outcomes within health care (Dennis, 2003), particularly for those living with chronic diseases (Van Dam et al., 2005), undergoing weight loss (Hwang et al., 2010), or experiencing mental health issues (Naslund et al., 2016). Peer support has been identified as leading to improved patient outcomes through enhancing links to clinical care, individualizing assessment and treatment, assisting in goal setting, education and skills training, ongoing follow-up support and links to community resources (Brownson & Heisler, 2009). Increasingly peer support is taking place online. Studies that have looked into the effectiveness of technology mediated, online or mHealth peer support for diabetes management for example (Rotheram-Borus et al., 2012; Aikens et al., 2014; Glasgow et al., 2012; McKay et al., 2002; Cotter et al., 2014; Gavrila et al., 2019; Chomutare et al., 2013), reach a consensus that they are a viable and effective approach. In particular, social media is identified as offering an opportunity for low-cost and accessible peer-support, particularly important in resource constrained and/or developing contexts.

Although the health care benefits of peer support are widely acknowledged, studies into online health support communities have tended to focus on the nature of peer support discourse (e.g. (Coulson, 2005; Gavrila et al., 2019)) and on how it may affect clinical outcomes, as opposed to on how peer support technologies maybe designed so as to more successfully facilitate effective discourse. Where attention has been paid to the design of

online peer support, it has largely been towards the design of bespoke apps (O'Leary et al., 2017) and SMS technologies (Rotheram-Borus et al., 2012) rather than to social media, despite social media being reported as presenting significant opportunities for peer support (Cotter et al., 2014; Naslund et al., 2016). As such, studies into social media-based peer support have largely conceptualized it as a naturally emergent phenomenon (Naslund et al., 2014) rather than as something that can actually be designed.

5.1.2 Understanding Digital Peer Support

Research into digital peer support in HCI has frequently sought to understand the character and qualities of digital peer support as it occurs on websites, forums and social media platforms. Notably, Newman et al. (Newman et al., 2011) investigated how and why people share health information in online health communities and Facebook. They discovered that people are very careful how and with whom they share their personal experiences within digital peer support communities. They identified six primary goals of people using digital peer support: *emotional support*, *social accountability*, *motivation*, *advice*, *impression management* (controlling how others view you) and *building a network*. Newman et al.'s work is important as it highlights the complexity of how people navigate digital peer support in order to both give and receive support in a way that is appropriate and comfortable for them. As such, they identify two primary design challenges for digital peer support system, firstly that online tools should allow users to selectively build, shape and access one's network, and secondly that a system should support users in managing impressions whilst meeting their health needs. Newman et al. suggest that this latter challenge could be met by coaching and templating users on effective communication.

Within the context of diabetes, Gavrila et al. (Gavrila et al., 2019) conducted semi structured qualitative interviews with caregivers and patients who are part of Facebook peer support group for type 1 diabetes. They found that members of the group identified peer support through giving and receiving technical, emotional, and medical support, as well as reciprocating support through 'giving back' to the larger community. They also found that

peer support extended beyond Facebook, resulting in connecting people in person, whether they were local or not. This work is valuable for identifying what types of support are being performed online, however a more systematic understanding of how to categorise support can be seen in Coulson's work on characterizing the types of support manifest within an online health community for irritable bowel syndrome (Coulson, 2005). Coulson analysed peer support discourse and established a typology of digital support: *emotional support*, to express empathy, support the emotional expressions of the recipient, or reciprocate emotion; *esteem support*, compliments offered which praise individuals and often comment on their abilities or attributes when coping with challenges; *information support*, to offer guidance for coping with challenges, particularly in relation to symptom interpretation, illness management and interaction with health care professionals; *network support*, to welcome new members and establish community norms of support; and lastly *tangible assistance*, referring to specific activities which individuals may undertake for the benefit of others. Although Coulson's work was focused around people living with irritable bowel syndrome specifically, I argue that this typology offers an initial fine-grained understanding of the types of support that manifest within digital peer support systems. As such I adopt, and later adapt, this taxonomy to understand and categorize participant notions of support and also how peer support manifests within the final design system.

5.1.3 Designing Digital Peer Support Systems

Understandably, the design of digital support systems has also been a matter of concern within HCI research. A number of studies have looked to produce design recommendations for digital peer support technologies. For example Lindberg et al. (Lindberg et al., 2014) proposed a number of interaction design patterns to inform a peer support system for children recovering from and dealing with the ramifications of life-threatening diseases. Derived from a series of design workshops with young children, these design patterns included categories such as: *helpful play*, *pose open questions* and *switch between single actor and multiple actors*, amongst others. Similarly, Haldar et al. (Haldar et al., 2017) explored the design opportunities for digital peer support within a hospital setting. Based on a series of

interviews and surveys with patients, they proposed a set of design considerations specific to this context, including: *leveraging the Electronic Health Record to match peers, protecting privacy and anonymity, and accommodating dynamic interactions and needs*. Interestingly, in their discussion of these considerations Haldar et al. compare the online community PatientsLikeMe with Facebook in terms of how a new hospital-based peer support system can learn from their benefits and limitations, although they stop short of suggesting the appropriation of either of these systems for their purposes.

The design of digital peer support has received particular attention within the context of mental health. Notably, O’Leary et al. (O’Leary et al., 2017, 2018) ran a series of design activities and workshops with people living with mental health issues and identified the value of peer support in matching peers on similarities beyond diagnosis, providing ‘just in time’ support, enhancing accessibility for meaningful participation and training peers to mitigate risk. Following from this work, O’Leary produced and deployed a ‘mid-fidelity’ prototype of a peer support chat tool to evaluate the different qualities of discourse resulting from either a guided or unguided chat structure (O’Leary et al., 2018). They found that guided chats were seen as more valuable for gaining solutions and insights, whereas unguided chats were seen as smoother and more easy-going. Interestingly, the chat tool, described as being a prototype, consisted of a Google Doc. In the study, peers opened a unique link to a Google Doc that contained a chat template for each of their eight chat sessions. Each participant entered the doc anonymously, but were always paired with the same chat partner. Limitations of the using Google Docs in this way were identified (the lack of a ‘send’ button and the real-time visibility of typing), however it is clear from their analysis that successful peer support did actually take place through their prototype tool. Although, the focus of the research was on the evaluation of guided chats to inform future technologies, I would argue that an unacknowledged contribution of this work is the successful appropriation of freely available, accessible software for this purpose.

Overall, previous research highlights the importance of designing a digital peer support system that is responsive to the individual situations and experiences of participants and that

supports the expression of multiple types of support. Furthermore, it shows how coaching or templating conversations can support effective communication, but that it is still important to allow for unstructured naturalistic conversation. I now detail the specific design context and constraints for the study in the following section.

5.2 Design Context: The Barbados Diabetes Reversal Studies

The study in this chapter is within the context of the Barbados Diabetes Reversal study, a community-based initiative focused on managing diabetes through extreme weight loss and maintenance of a healthy diet. Diabetes is acknowledged as one of the most pressing health challenges in the world. It is predicted by the WHO that the number of people living with diabetes will more than double from 171 million to 366 million between 2000 and 2030 (Wild et al., 2004). When uncontrolled it significantly increases the risk of heart attacks, strokes and renal failure, and can lead to cardiovascular disease, blindness and even amputation (Narayan et al., 2000). The costs of diabetes are as much an economic issue as they are a health issue, with the global economic burden of treating and preventing diabetes and related conditions projected to increase from U.S. \$1.3 trillion in 2015 to between \$2.1–2.5 trillion by 2030, the majority of which will be in developing countries (Bommer et al., 2018). Disease management approaches, that seek to provide multi-component care to actively manage or prevent diabetes, offer a way of both improving health outcomes and combatting spiraling healthcare costs (Mangione et al., 2006). One important disease management strategy is the use of peer support, identified as the provision of emotional, appraisal and informational assistance by those in your social network with experiential knowledge (Dennis, 2003).

The Caribbean population has amongst the highest rates of Type 2 diabetes in the world (Federation, 2017). In 2012, the prevalence of diabetes in adults in Barbados aged 25 years and over was 18.7% (21.0% in women, 15.9% in men) (Howitt et al., 2015). In December 2014 the Virgin Unite funded Barbados Diabetes Reversal Study (BDRS1) was launched by Sir Richard Branson (Kelly, 2016). The study was inspired and guided by Prof. Roy Taylor's work on reversibility of Type 2 diabetes (Taylor, 2013) and the successful DiRECT study into the

remission of diabetes through intensive weight loss (Lean et al., 2018). The BDRS1 aimed to determine the feasibility of a short period (2-3 month) intensive weight control approach to restoring normal glucose and insulin metabolism in adults in Barbados (Bynoe et al., 2019). The study successfully associated a mean weight loss of 10 kg with remission in 60% of participants at 8 weeks, and 38% at 8 months, establishing the feasibility of the approach. The study also identified a number of other factors, including food environment (lack of healthy options); cultural expectations (large portion sizes) and acceptability of rapid weight loss (negative attitudes and comments from peers) as challenges to adherence to the program. By far the main facilitator of success identified from the qualitative analysis, was the availability of social support: *'Those participants having a diverse network of informal support systems made up of family members, close friends, co-workers and other participants, as well as formal support systems including the project staff and their primary doctors, had least difficulty in following the intervention.'*(Bynoe et al., 2019)

These findings were used to refine the design of the follow up Barbados Diabetes Reversal Study 2 (BDRS2). BDRS2 was to take similar timeline to BDRS1, with 12 weeks of intensive calorie-controlled weight loss through meal replacement shakes, followed by 3 months of a guided balanced diet; and a final 6 months of self-supported healthy eating and lifestyle changes with minimum contact from clinicians. The primary difference was that the BDRS2 aimed to *'maximize the social support'* within the study by adopting a church based and community focused approach. As well as recruiting participants, some community members would also be recruited and trained to take on the role of 'health advocates' and assist with clinical duties as well as more formally act as peer support. It was identified in BDRS1 that access to group support through the use of messaging and social media appeared to be important for some individuals, and so the incorporation of social media in the design of intentional social support was seen as a priority for the study. It is within the context of this wider study (BDRS2) that the work detailed in this chapter takes place.

Initial proposals for the design of a social media based social support system favoured the creation of a bespoke app or website that used popular features of social media. However, as

this was intended to be a community supported initiative that aimed for long-term self-sustained changes in life style, issues around the costs of designing, developing and sustaining a bespoke application for peer support became immediately apparent. This was further complicated by the general challenges of encouraging participants to use bespoke health apps. For example, research into the use of diabetes apps showed that even after trying and positively perceiving diabetes apps, only 7.4% of participants actually go on to use them daily (compared to 81.5% using social media daily) (Katz et al., 2015), where being 'too much work' was seen as a significant barrier. From this, it was identified that the most viable solution would be the appropriation of social media platforms that the study participants were already comfortably using. Appropriating existing social media has the additional benefit of requiring little additional technical infrastructure and so fitting well within the timescales and costs of the study. It is also a more accessible approach, as it does not require participants to download, install and learn a new application, therefore lowering barriers of participation, which is critically important in resource constrained contexts. As social media is already an adopted part of daily life for many participants, it also has the benefit of fitting alongside existing practices and so not requiring significant additional work, as well as being more authentic and genuine as to how participants communicate with each other reportedly another vital aspect in social support (Van Dam et al., 2005).

5.2.1 Participants in BDRS2

Three churches within Barbados were identified by the clinical team to take part in BDRS2 (a fourth church dropped out during the preparation and planning stage of the study). The primary contact at each church, referred to as the 'health lead', was recruited due to their prior medical experience in nursing and/or medicine. The health lead introduced the study to congregants of their churches, and recruited internally through presentation, official notices and word of mouth for participants on the study. The acceptance criteria for inclusion in the study was that participants had to be residents of Barbados, male or female, ages 18-70, diagnosed with type 2 diabetes for less than 6 years or classified as pre-diabetic, and with a body mass index greater than 27 kg/m². In total 31 participants (3 male), with a mean age of

51 (SD=8) were recruited from across the three churches. Furthermore, BDRS2 had a rolling recruitment model, where an additional cohort of participants could join the study at a later date. Due to the ethical considerations of the study, participants from different churches would not interact with each other, and participation would remain anonymous.

Additionally, a cohort of 'health advocates' (HAs) was recruited from the congregants. HAs were tasked with assisting with the clinical aspects of the program including taking clinical measurements (waist and hip circumference, blood pressure, weight, blood) as well as assisting with lab tests and offering advice and information around nutrition, physical activity and performing cooking demonstrations. The rationale for the inclusion of HAs in BDRS2 was to support the community focus of the initiative. By including members of the community as an extension the clinical team (many of whom were highly respected within their communities) it was hoped to improve community ownership of the initiative, and consequently diet adherence and health impacts. In total 18 HAs were recruited from across the three churches. As the responsibilities of HAs positioned them as the central point of contact within their churches for participants on BDRS2, and also as willing to take on additional work in support of the study, my initial design activity focused on the role of the HA in social media peer support.

5.2.2 Ethical considerations

The research team was split across two universities, with the clinical team based in Barbados and the HCI team based in the UK. Connections between the two were formed through a mutual academic colleague at a third university who had been involved in BDRS1. Ethical approval for this study was granted both by the University of West Indies (UWI) as part of the ethical review process for the clinical BDRS2 study, and additionally by Newcastle University, specifically concerning the multi-phase design process described in the following section. As peer support in BDRS2 was intended to be community-driven (not researcher-driven) the decision was taken for the members of the UWI team, who had pre-existing relationships with the church communities, to accompany and introduce the HCI team to participants within the

workshop, and for the UWI team to remain the principle point of contact throughout the study. Additionally, all participant data was anonymised and securely stored in an external hard drive.

5.3 Design Process

5.3.1 Using the Unplatformed Design Model

The design process detailed in this chapter is guided by the model for *unplatformed design* and as such is a primary application of that model in a real-world context. Following from the challenges outlined at the end of the previous chapter, the model is applied in both a *pragmatic* and *descriptive* capacity. Its pragmatic utility is explored through the translation of insights generated in design workshops into the final peer support system, based on specific configurations and augmentations of the material qualities of WhatsApp. Its descriptive utility is explored through the use of the model to give vocabulary to, and understanding of, the potential configurations and augmentations of social media within the context of peer support. To recap the material qualities briefly:

- **Morphology** - the overall form and structure of connections and relationships between users
- **Role** - the communication, understanding and designation of a user's identity and understanding of related actions, duties and expectations
- **Representation of activity** - the manner and methods by which the activity of users is presented, curated and navigated, either within a social media technology or externally
- **Permeability** - the ways by which a system can receive, output and exchange information with other systems

As well as providing a lens with which to analyse the results of the design activities, these material qualities also informed the design of the activities themselves, details of which can be seen within the subsequent sections. Table 7 provides a summary of the phases of the design process; the design activities that took place in each phase; the explicit peer support goals of each phase; and the overall steps within the unplatformed design process.

	Phase 1	Phase 2	Phase3
Overall Goal	Understanding context	Training and design insight	Design, Deployment and Evaluation
Design Activities	Focus group with mixed group of HAs	Three workshops with HAs at three churches	Design and deployment of peer support system Three evaluation workshops
Peer Support Goal	Explore current notions of peer support and care	Deliver training on digital peer support	HAs deliver peer support over twelve weeks through peer support system
Unplatformed Design Goal	Establish what social media platforms are viable for peer support	Generate insights on how peer support might work on chosen social media platform	Produce final peer support system using unplatformed design qualities of social media

Table 7. The three phases of the design process, and what aspects of peer support and unplatformed design they were intended to incorporate and support

The design process for peer support for BDRS2 started in early 2018 approximately a year before the start of the study in April 2019. The process spanned three distinct design phases, with an evaluation built into the final phase. This three-phase structure evolved through the process of enquiry, with the analysis of each phase informing the next. Phase 1 was undertaken by the clinical team before my involvement in the study, with the following 2 phases designed and directed by myself. Phase 1 consisted of an initial focus group with a mixed group of HAs, for needs elicitation and context gathering. Phase 2 consisted of a series of workshops intended to generate design insights and deliver digital peer support training to HAs at each church, Phase 3 consisted of the design, deployment and consequent evaluation of the peer support system and accompanying materials. A qualitative evaluation took place in workshops at each of the churches with a mix of HAs and participants. All three phases are presented in the following sections, the descriptions of each phase are accompanied by a

short presentation of the findings from each, as well the implications of those findings on the design of the consequent phase.

5.3.2 Phase 1: Understanding Context

The first phase consisted of a focus group between members of BDRS2's clinical team and 6 HAs from the three different churches. The focus group took the form of a loosely structured interview and group conversation around peer support, social media, and community perceptions of the initiative. The focus group took place in Barbados, and lasted approximately 2 hours. Although I did not design or conduct the focus group activity, the audio from the discussions was transcribed by a member of the clinical team and field notes were taken. These transcripts and field notes were then passed to me back in the UK, whereupon I was asked by the clinical team to establish a direction for the unplatformed design process.

In order to do this, I undertook a deductive thematic analysis of the data, informed by the early analytical lens that I used in the previous chapter. The lens, which I used to analyse the three case studies, consists of four points of focus: *tools*, *activity*, *information flow* and *social structures*. I rephrased these into four context specific questions, and used these to guide a deductive thematic analysis: 1) what are the social and cultural contexts of Barbados in respect to peer support for BDRS2 (*social structures*); 2) what are the backgrounds, experiences and competencies of HAs in respect to peer support (*activity*); 3) how do HAs communicate and understand support (*information flow*); 4) what social media applications would be most suitable for an unplatformed peer support system, e.g. which ones are already widely used and understood by HAs and participants (*tools*).

The outcomes of these questions were intended to inform the design of the next phase of the process. Specifically, they would be used to identify the goals of the next phase in terms of fostering an understanding of peer support, and the goals of the unplatformed design activities.

Findings

In respect to 1) the social and cultural context of Barbados in terms of peer support for BDRS2, the focus group participants reaffirmed the challenges identified in the previous BDRS1 study (Bynoe et al., 2019), such as negative attitudes to weight loss from family and friends (*'Why do you not want to eat? You sick?'*) and the lack of healthy options available on the island. They further highlighted the importance of support from friends, particularly in situations where support from a spouse or partner may be lacking or worse.

In respect to 2) and 3), the backgrounds, experiences and notions of support of HAs, the focus group participants acknowledged the variety of experiences and backgrounds of the group, yet all identified themselves as *'caring'* individuals. Despite, this when discussing what peer support might look like in BDRS2 the participants had a very narrow concept of care. Discussion of peer support focused almost exclusively on information support (according to Coulson's types of support (Coulson, 2005)), that is the delivery of correct nutritional and medical information to participants, as opposed to emotion, esteem, network or tangible support (*'You give them the right information, and they can make healthy choices'*). This was possibly due to a number of the older HA's having ex-nursing backgrounds, combined with Barbados being a society that places a lot of value on listening to elders. Furthermore, despite being active users of social media, it was not clear to participants how interacting through social media may constitute caring.

In respect to 4) which social media applications would be most suitable for an unplatformed peer support system, it became clear that WhatsApp was by far the most popular social media/messaging platform on Barbados with all but one of the participants saying they used it every day. This finding is reinforced by global adoption statistics (SimilarWeb, n.d.).

Implications

These findings were used to support the design of the next phase of the design process. Firstly, that for peer support to be successful, a training workshop would need to broaden HA's

notions of peer support to include a wider variety of types of care beyond informational, including directly responding to negative attitudes to weight loss. Secondly, that WhatsApp would be the most viable platform with which to design a peer support system due to its prevalence on the island and already being a part of everyday life. In terms of unplatformed design, this necessitated a finer grained understanding of how HAs use the various features and affordances of WhatsApp so that it could be *configured* most effectively. But also, a deeper understanding of how peer support may actually take place on WhatsApp (in terms of acceptability, care burden and cultural/social norms). This was to inform how WhatsApp may be appropriately *augmented* by the design and application of a system of peer support. From this I proposed a series of workshops with HAs from all three of the churches.

5.3.3 Phase 2: Design Insight and Training Workshops

Three workshops were conducted in December 2018, a few months before the start of BDRS2. Each workshop took place at one of the churches, with the HAs from that church. In total 19 HAs attended, with 6 in the first, 7 in the second and 6 in the final workshop. Each lasted 2 ½ hours and were ran by myself and a research colleague with a background in health and nutrition. I was responsible for designing the content of the workshops, which consisted of three activities. The first two smaller activities were intended to train the HAs in broader notions of care than those identified in the previous phase. Whereas the final activity was intended to generate design insights to support the design of the final system. Data collected consisted of audio recordings of the workshops, field notes and artefacts generated within the workshop.

The first short activity involved the HAs writing down and sharing examples of when they had been caring, or when someone had shown them care. Using Coulson's taxonomy of types of care (Coulson, 2005) as a basis, the research team then led a discussion on what types of care were represented by the shared examples as well as providing pre-prepared examples of each of the different types. The second activity moved from these broad notions of care to talking specifically about how they might manifest in BDRS2. This took the form of a group

storyboarding activity. At the start of the activity the group were presented with a pre-prepared scenario where a participant on the study was struggling to stick to the intense diet. The scenarios were anonymously based on qualitative data from BDRS1 so as to ensure relevance and authenticity. Then, using a pre-printed template and paper props, the group storyboarded how the HAs may support this individual, with particular emphasis on how WhatsApp may be used. See figure 9 for the completed storyboards.

In order to generate design insights, the final activity in the workshops was informed by the model of unplatformed design. My approach for understanding how the *morphology*, *role*, *representation of activity* and *permeability* of WhatsApp should be configured within the context of BDRS2, was that I should attempt to understand the existing morphology, roles etc. of the community with which I am designing. To achieve this, I worked through the material qualities of the model to formulate a number of possibilities of how WhatsApp could be configured and/or augmented as a peer support system, and posed these to the workshop participants in order to generate insight into the acceptability of different possibilities within the design space. In this way, the model was used for its *descriptive* utility, in that it facilitated a discussion of the design space. Note that I avoided using the terms configuration, augmentation and referring to the material qualities of the model when formulating these questions (even though they guided my thinking), as the use of these unfamiliar terms would likely have made the activity less approachable for participants. Examples of the types of questions that were formulated by this process are as follows:

- *Morphology* – what is manageable for HAs in terms of group size? What is appropriate when dividing participants into groups? Are HAs comfortable/competent creating groups and administrating membership? Are there any existing group hierarchies or organizational structures that can be transferred to the peer support system?
- *Role* - are participants comfortable/competent in taking on administrative tasks on WhatsApp? Are there existing roles within the community that can be transferred to the peer support system? What is acceptable or manageable in terms of specific duties of roles?
- *Representation of activity* – are participants comfortable/competent generating and sharing multimedia content? Are participants happy to share photos/videos/images?

What are the participant's perceptions of what type of activity/peer support conversations should be public or private?

- *Permeability* - are participants comfortable/competent in posting external resources into WhatsApp groups? What are the participant's perceptions of this external content (e.g. should it be verified by a health body)? Are participants comfortable/competent in exporting data from a WhatsApp group?

Ultimately the activity took the form a novel card sorting technique using a deck of 36 bespoke cards (see figure 8 and appendix C.2). Card sorting has a long history within Participatory Design where it is a widely used design method in which co-designer(s) organise cards into categories or select particular cards to visualise processes, express priorities or inspire creative processes (Velden & Mörtberg, 2014). Traditionally card sorting techniques are 'open' in that the choice of categories is decided by co-designers. The method I employed was 'closed' card-sorting in that the categories had been predetermined, and in a further divergence, were not discrete (as is typical) but in fact represented as a sliding scale. Each card to be sorted contained an illustrated example of an action or activity using WhatsApp for peer support, based upon my application of the unplatformed design model above. The cards were dealt out to HAs, who would take it in turns to read one out. Then collaboratively the group had to decide where to place this card on a central graph. The graph has two axes, with one ranging from '*happy to do this*' to '*not happy to do this*' and the other ranging from '*need no help to do this*' to '*need lots of help to do this*'. The axes of the graph were not given numerical values to encourage more descriptive discussion of their placement (to avoid discussion along the lines of '*I think this is a 4... no I think it is a 5*'). The completed graphs can be seen in figure 9. The workshops were audio recorded, field notes were taken, and created artefacts were captured.









 <p>Encouraging others to share their stories in a group</p>	 <p>Welcoming new people to a group</p>	 <p>Sending reminders to people about the clinical tests</p>	 <p>Asking if people need help using WhatsApp</p>
 <p>Sending individual messages if you've noticed someone has not contributed for a few days</p>	 <p>Recommending diet friendly places to eat out in a group</p>	 <p>Give tips on how to say no to people who are offering you food, without being rude</p>	 <p>Replying quickly to people who ask questions</p>

Figure 8. Examples of cards used within the design workshop card sorting activity

Findings

A review of the qualitative data, including audio recordings, field notes and artefacts, generated during the first activity show that the HAs in all three workshops understood and were able to give examples and discuss a broad range of types of care. This was not reflected as clearly in the storyboarding activity however, where two out of the three groups again focused on primarily information care as peer support. For example, *'providing other options for socializing'* or *'giving options, smaller portion sizes to children'*. Two of the three storyboards did present *'giving words of support'* and *'offering personal testimony/experience'* with one group highlighting esteem support *'you look lovely'*. Encouragingly all the storyboards placed WhatsApp as central for *'checking up regularly'* and *'periodic calls'*.

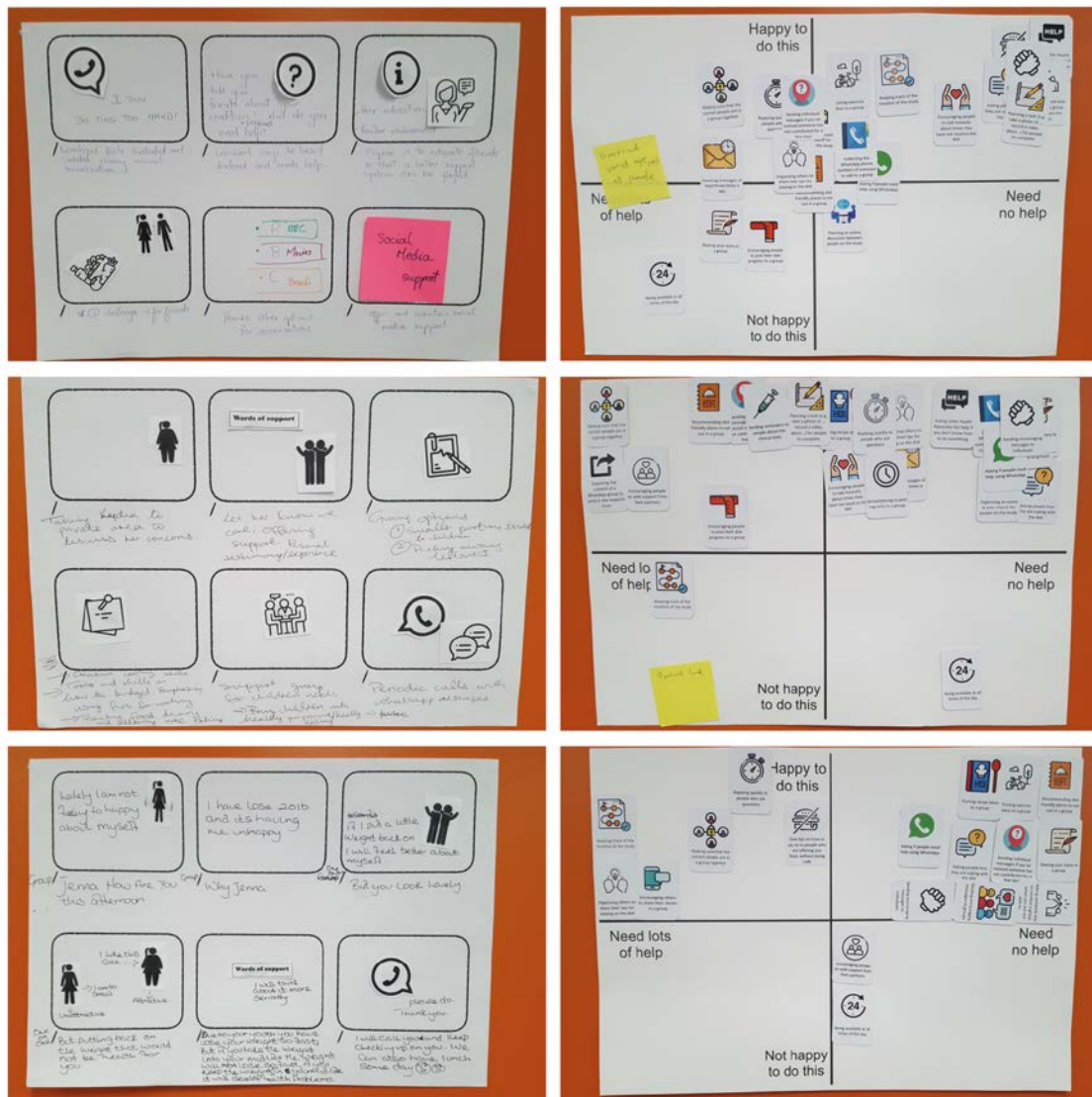


Figure 9. The completed storyboards (left) and completed graphs (right) from the three design workshops

Most relevant for the unplanned design process were the results of the 3rd activity, where in all three groups, the vast majority of cards were sorted in the top half of the graphs indicating that the HAs were 'happy to do this', and placed in the right side of the graph, indicating that the HAs 'need no help to do this'. Because of this, it makes most sense to examine those cards which were not reported so highly. Categorized under the material qualities from which the cards were originally derived, these were as follows:

- Morphology – *‘Making sure that the correct people are in a group together’* was identified as needing lots of help in all three groups, although all were happy to do this. Furthermore, it was clear from the discussions that HAs saw themselves as a coherent group within the context of their church and did not see value in dividing into smaller groups.
- Role - *‘being available at all times of the day’* was identified in all the groups graphs as not happy to do this. Those that were identified as needing help were predominantly organizational duties of role, such as *‘making sure people are in the correct group’* and *‘keeping track of the timeline of the study’*. Indicating that the HA role within the peer support system may need organizational support.
- Representation of activity - one group placed *‘encouraging people to post their diet progress’* slightly below the central line, due its potentially sensitive nature, and *‘encouraging people to seek support from partners’* also featured in another group’s graph, again due to sensitivity around some participants domestic situations.
- Permeability - Although most cards regarding permeability of WhatsApp were classified as needing no help, one group did place *‘exporting the content of a WhatsApp group to send to the research team’* as requiring help. This was also backed up by the discussion data where a small number of older HAs expressed desire for specific assistance with uploading and posting media, and that they may be challenged by some of the more technical aspects of using WhatsApp (e.g. changing a group’s icon, exporting and importing media).

Implications on study

The results of the card graphing activity clearly demonstrated that the HAs were motivated and enthusiastic in their role. They also showed that using WhatsApp for peer support was highly acceptable in terms of social and cultural norms, and also generally feasible in terms of technical competencies and comfort using WhatsApp. Discussions around group size and composition (morphology) suggested that configuration of one large group per church for HAs and participants together would be best suited as the central locus of the peer support system, with the option to produce smaller groups as and when required (e.g. for discussion of sensitive topics as reported above). Also, discussions that emerged during the card placement activity around organizing and scheduling of peer support activities, suggested

that any system process would be better led by the HA's own understandings of their community instead of creating a formalized and regimented process of peer support (e.g. regular pre-determined touch points), which HAs felt would be harder to maintain over time.

Although the workshops were relatively successful in training the HAs to broader notions of care in peer support than information care, the prevalence of information care in the storyboarding activities demonstrated the need for additional support in this area. Similarly, the request for technical support by some of the older HAs (as reported under permeability in the previous section) would also have to be incorporated into the final design and deployment.

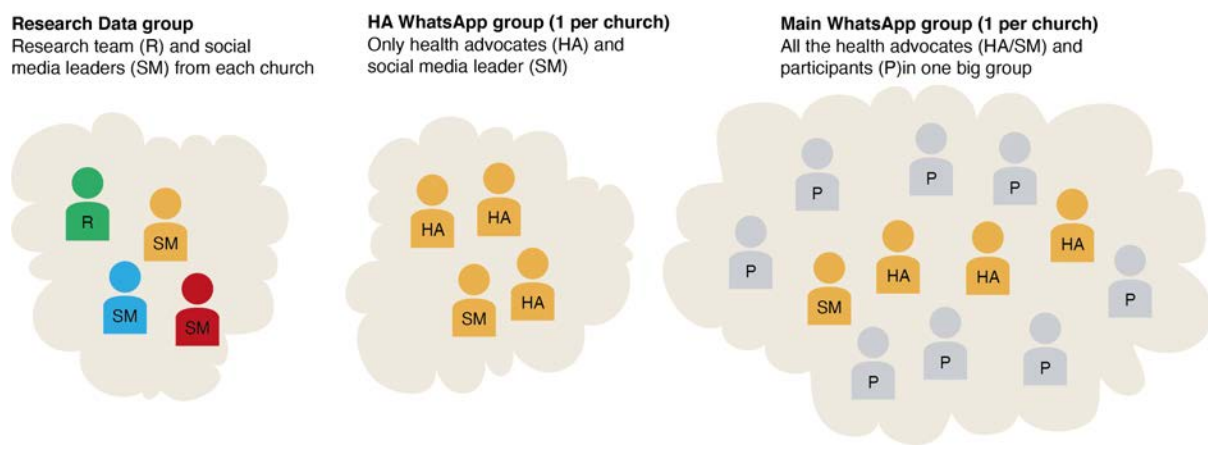


Figure 10. The morphology of WhatsApp groups for the peer support system

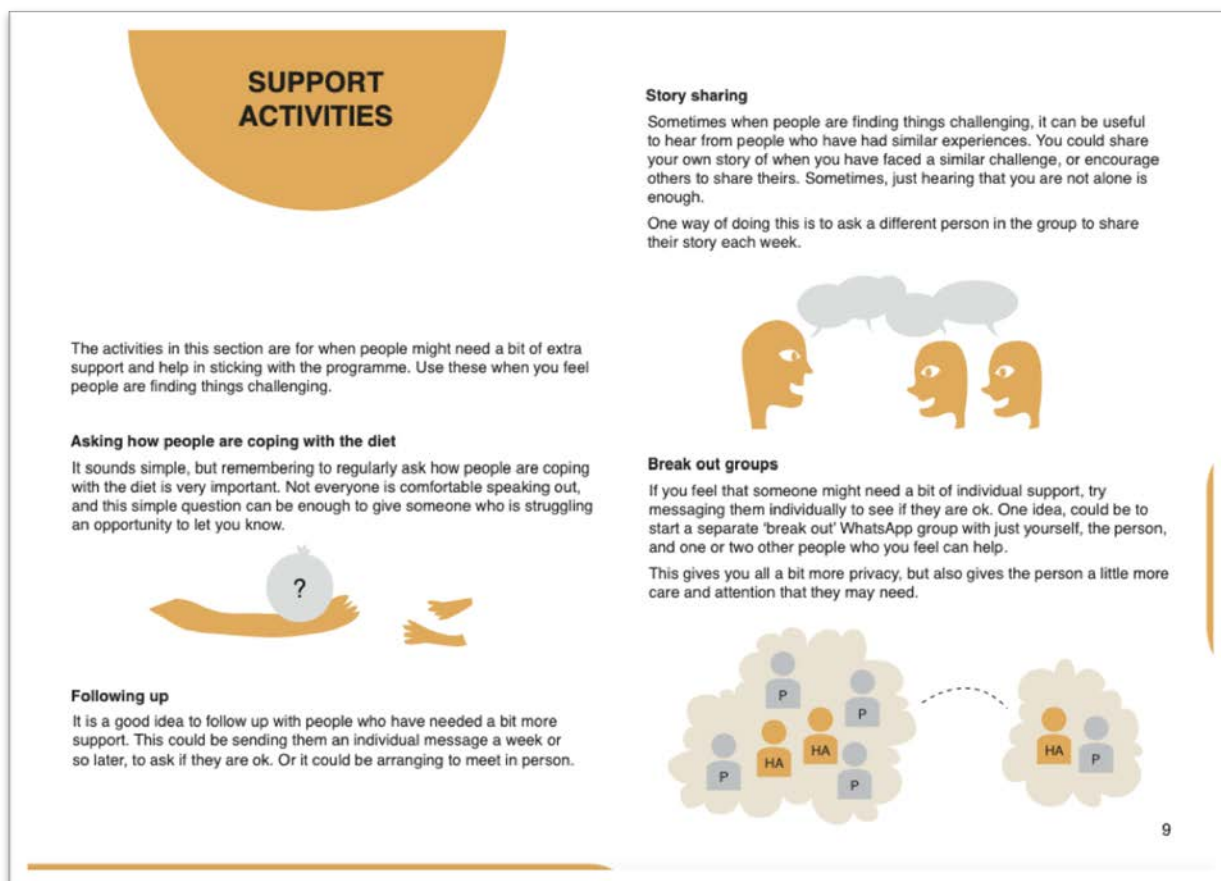


Figure 11. A sample of the ‘peer support on WhatsApp’ handbook distributed to HAs (the full handbook can be seen in appendix C.3)

5.3.4 Phase 3: Design, Deployment and Evaluation

The third phase of the design process incorporates the creation of the final peer support system, a three-month deployment of the system and a series of workshops intended to evaluate the system.

The Peer Support System

The final design of the peer support system took the form of two interlinked WhatsApp groups for participants and HAs as the central locus of peer support (see figure 10) with a third administrative group including the research team; the creation of a ‘Peer Support on WhatsApp’ handbook to assist in broadening types of care (see figure 11); and the creation

of a new 'social media leader' role to assist the research team, and advise other HAs in the more technical aspects of WhatsApp. The decision to take a relatively lightweight approach to both the formalizing of peer support activities and to the configuration of WhatsApp, was based on the findings from previous phases that indicated that the HAs were by and large comfortable and confident in delivering peer support through social media. More specifically this decision was arrived at by making numerous small design decisions around the four qualities of social media that best matched the findings of the previous phases, the details of which are discussed below. In this way, this is an example of the pragmatic utility of the unplatformed design model in respect to its ability to productively inform the design of a peer support system. I now describe these design decisions in terms of each of the material qualities.

Morphology

Due to results of the design workshops indicating that HAs would felt it most sensible to keep all participants together, and due to the relatively small participant numbers (31 participants and 18 HAs across 3 churches) I decided that WhatsApp should be configured as one large main group that included all the participants and HAs at one church, with a second smaller HA group that just included the HAs from each church. This configuration would be repeated at each church. Alternative options considered included splitting the participants into smaller groups, each with a subset of HAs. However, this option would have reduced the group sizes significantly, in way that may have damaged a sense of community cohesion, potentially obfuscated communication and harmed the openness and transparency crucial to peer support groups (Naslund et al., 2016; Gavrilă et al., 2019).

The rationale behind the creation of the HA specific group was due to the requirements for a place for HAs to have specific conversations not suitable to the main group, and was also informed by my own experiences designing WhatFutures (chapter 3) whereby having a single group for administrators made it easier to manage the dissemination of information. The main group was designed to be the primary location for peer support, though I also

encouraged HAs to dynamically alter the morphology (for example through creating breakout groups) as and when required. The smaller HA group was designed to be an administrative group where HAs could organize themselves and discuss any topics with more privacy for the larger group (for example seeking advice on how best to support specific individuals).

Additionally, another group was configured that included the social media leaders (see role) from each of the churches as well as the research team. This was the only group that included the research team, and was intended as a primary point of contact for HAs with the research team, but also as the avenue through which data would be transferred (see permeability).

In respect to *soft augmentation* of morphology, all the groups were named so that the intended function of the group was clear and explicit (e.g. 'X church diabetes weight loss support group', 'Church X HA group' and 'BDRS2 Research Data group'). This would also be reinforced and modelled by the HAs as part of their role (see next section)

Role

BDRS2 already incorporated a specific health advocate (HA) role, as such it made sense to sustain this role (and the associated power balances and expectations that come with it) within the peer support system by situating HAs as administrators of the peer support WhatsApp groups. In terms of *configuration*, this meant assigning each of the HAs with administrator privileges within the WhatsApp groups. The actual duties and responsibilities (*soft augmentation*) of HAs in respect to the peer's support system was already well established through the previous workshop's activities and in the wider BDRS2 study. This was further reinforced through the production of a HA handbook (see representation of activity).

The findings in the previous phase however, had demonstrated that some HAs may be challenged by some of the more technical aspects of using WhatsApp (e.g. changing a group's icon, exporting and importing media). Therefore, I created an additional 'social media leader' role within the HAs at each church. This role was involved acting as 'tech support' of sorts to

both HAs and participants, but also crucially to act as the primary contact between the peer support groups and the research team, responsible for both the distribution of information and the exporting of data. The social media role was entirely a *soft augmentation*, in that it was not recognized at system level, but the additional duties and expectations that came with it were communicated by myself, and reinforced through the configuration of the research data WhatsApp group, whereby the social media leaders as had direct contact with the research team.

Representation of Activity

Due to the ethical requirements for anonymity for participants on BDRS2 (outside of the research study), it was important that the activity and conversations within the WhatsApp groups were not externalized or made public in anyway. However, as any successful peer support is built around the sharing of each other's activity and experiences, it was highly desirable for participants and HAs to equally share their activity, experiences, advice, information and resources as appropriate. To support this goal, I created a 12 page, A5, 'Peer Support on WhatsApp' handbook (see figure 11) which was distributed both physically and digitally to all the HAs. The handbook acted as a recipe book of sorts, including a list of different types of activities that should take place in the groups. These activities were themed and grouped as responses to challenging times on the diet (such as low motivation, times of failings, lack of information/options) that were based on findings from the BDRS1 and weight loss literature (Purpura et al., 2011; Hwang et al., 2010). The activities were also designed to express all the different types of care (Coulson, 2005), to further support a broadening of notions of peer support in HAs. The handbook constituted a significant *soft augmentation*, in terms of unplatformed design, as it set out a clear set of activities, processes and communication norms for the whole peer support system, that was entirely enforced through social factors.

The activities in the handbook were expressly multimedia, to take advantage of the affordances of WhatsApp (again inspired by previous work on WhatFutures). Examples of

included: taking a 'shake-selfie' with your meal replacement shake; taking a photo of something that inspires you to stay on the diet; recording an exercise video; creating a shared information resource on google docs; scheduling 'live' discussions around particular topics; creating 'break-out' groups. The full handbook can be seen in appendix C.3. As well as providing inspiration and loose structure to peer support, the activities can also be seen as examples of 'coaching' on effective communication. As discussed in related work by Newman et al. (Newman et al., 2011), coaching responds to the challenge within peer support of participants managing impressions whilst also meeting health care needs.

Permeability

At the time of the study WhatsApp did not have any publicly available API, as such the inputting and outputting of data had to be performed manually, similarly to how it was performed in WhatFutures (chapter 3). As previously mentioned this was facilitated through the social media leader role, who had access to the research team through a specific administrative WhatsApp group. To formalize data capture for the study, the social media leaders from each church would download the chat history from both the HA and the main participant WhatsApp groups, every two weeks on a Monday for a total of twelve weeks. Just members of the research and clinical team would have access to this data.

In a similar way to WhatFutures, this exporting of data from WhatsApp constituted an example of *hard augmentation* within the unplatformed design. In order to make things as easy as possible for the social media leaders to export the data, a unique shared Google Drive folder was created for them. Google drive was chosen for this due to its existing integration with WhatsApp's export functionality and the fact that the social media leaders already had pre-existing Google accounts and did not therefore need to sign up to or learn any new software. Ethical approval was granted for the use of Google Drive for the purpose of exporting, with the proviso that the data was not stored there long term. To ensure expedited

removal of the potentially sensitive data I created an 'If This Then That' (IFTTT)⁹ connection to automatically notify me as soon as export was made. The IFTTT connection sent an automated email to my email address when any file was added to the shared google document, at which point I would remove it from the google drive and place it in an encrypted hard drive. This constitutes a primarily researcher facing *hard augmentation*, that was designed to assist in data capture and storage.

Process and Deployment

As discussed in the previous chapter, process, referring to the configuration and augmentation of material qualities at certain points in time, is a key concern of any coordinated participation. The temporal elements of the final design for the peer support system were necessarily constrained by the overall process of the BDRS2 study within which it was situated. As such the decision was made to configure the participant facing WhatsApp group (e.g. set up the group, post welcome information) at the start of the BDRS2. With the configuration of the HA and researcher/social media leader groups a few weeks in advance of this. Furthermore, the handbook, and other soft augmentation were distributed in advance of the start of BDRS2 so that HAs could become familiar with them.

The BDRS2 study started in April 2019 along with the WhatsApp peer support system. In all three churches HAs had created the required WhatsApp groups, designated a social media leader, and had read and received the handbook, a few weeks in advance of the actual start of the study. The full BDRS2 runs for twelve months (and longer with rolling recruitment), however the focus of my analysis is on the first intensive twelve weeks, where participants adopt a heavily restricted calorie-controlled diet to facilitate rapid weight loss. In order to

⁹ <https://ifttt.com/>

hopefully create a positive onboarding experience, I asked the HAs to try one or two of the activities in the handbook within the first three weeks of the study, after which they were instructed to use their own expertise as to what activities would be best for them and their groups.

Evaluation Workshops

In order to evaluate the deployment, I planned and delivered three evaluation workshops at the three different churches. I was assisted in delivery by the same colleague who had assisted in phase 2. The workshops took place at the end of the first twelve weeks on BDRS2. Unfortunately, due to scheduling complexities the workshops ended up taking place during the 'crop over' festival, one of the biggest public holidays within Barbados. Although my intention was to interview both HAs and participants as extensively as possible, many were off the island or otherwise unreachable during this time, and so with the assistance of the clinical team we scheduled three workshops with a mixture of HAs and participants from different churches. The first workshop was with HAs from church 1 and 2, the second was held with HAs and participants from church 3 and the last was with participants from church 1 and 2. There was no overlap in participation between the workshops, and where participants from different churches attended the same workshop, they were made aware of this beforehand and asked for consent.

Each workshop lasted approximately 2 hours, involved two activities and were conducted by myself and my research colleague with a background in health and nutrition. I was responsible for designing the content of the workshops. The first activity asked participants and HAs to look back on the messages sent within their peer support WhatsApp group and identify and share supportive message that they or someone else had sent. This was intended to get the workshop participants reflecting and discussing their experiences of support within the WhatsApp group.

The second activity involved the group collaboratively placing cards on a six-point Likert scale according to their agreement (from strongly disagree to strongly agree) with the statement on the card. There were 21 cards in total (see appendix C.6). The statements on the card expressed a variety of sentiments aimed at assessing perceptions towards the peer support system (see table 8 for examples). In a similar fashion to the previous phase’s design activities, cards were dealt out to workshop participants, who would take it in turn to read the statement out loud to the group. The group would then discuss the statement, and attempt to reach a consensus on where on the Likert scale the statement card should be placed. Again, the focus here was not on the actual placement of the cards, but rather on the discussion that arose within the group. Data collected consisted of audio recordings of the workshops, field notes produced by myself and my colleague and artefacts generated within the workshop.

Topic of concern	Example statement cards
Workloads and the burden of care	I felt I should reply even when I didn’t want to, there were too many messages
How the system fitted into the lives of participants and HAs	the group blended into my everyday life, the group was a distraction to me
Authenticity and naturalness of communication	conversation in the group felt natural, I spoke differently in this group than in other WhatsApp groups, I feel like others in the group genuinely wanted to support me
Comfort talking about sensitive issues	I was happy to share personal information, I didn’t want to share times when I had found the diet difficult

Table 8. Example statement cards for the evaluation workshop

5.4 Findings

5.4.1 WhatsApp data

WhatsApp chat data was exported by the social media lead at each of the churches at the end of the first three months of the study. This consisted of both the HA administrative group and

the main chat support group at each of the three churches, totalling six WhatsApp chat transcripts covering the period of April – June 2019. A sample transcript can be seen in appendix C.4. To identify the presence of peer support within the chats, myself and my colleague who assisted me within the workshops, performed a deductive thematic analysis of the content based on Coulson’s types of support (Coulson, 2005), where each message was coded according to the types of support that were represented within. An initial dual-coding of the same transcript yielded high inter-rater consistency, but also identified a new type of peer support message distinct from those proposed by Coulson. I referred to this as *spiritual support*, in that it they linked success on the diet directly to God. Table 9 shows a breakdown of these categories along with example statements from the transcripts.

Classification of support	Example statement
Informational	<i>“To make scrub the beets dry with paper towels and slice thinly, spray pan with olive oil, bake in toaster oven, season if desire with pepper and salt.”</i>
Esteem	<i>“👍👍👍 I know you all got this. You are more than conquerors. Warriors fighting for better health 🏃‍♀️🏃‍♀️🏃‍♀️🏃‍♀️🏃‍♀️🏃‍♀️”</i>
Emotional	<i>“I just wanna say how happy I am with you who are participating in the program. Seeing the drop in your measurements and weight despite the challenges some are having, I am encouraged.”</i>
Networking	<i>“I encourage you to share not only your triumphs and recipes but also your struggles. Someone else may be having a similar struggle and may be able to help”</i>
Spiritual	<i>“Prayer that God will continue to keep each and every one us strong throughout the day and coming week to stay focused on our new lifestyle and healthy way of eating” and “I know i can do it with God's help and your encouragement.”</i>
Tangible	<i>“Hello [], Perhaps we can talk before you start about how to space the meals to reduce stomach pains”</i>

Table 9. Example statements of the types of support used for deductive thematic analysis of the taken from the WhatsApp chat exports.

The results of the classification of WhatsApp messages can be seen in table 10. Unsurprisingly, the majority of supportive messages (and messages in general) were sent in the main groups as opposed to the HA groups. Within this, what can be clearly seen is the prevalence of informational types of support, accounting for 47.3% of all supportive messages. Many instances of informational support were found directly after direct appeals for information (e.g. *'can I eat beans on the diet?'*) and were primarily answered by HAs. However, the majority (~60%) of informational support consisted of sharing ideas for food and drink (e.g. *'do you know we can make our own cappuccino, yes we can, 2/3 cup hot black coffee, 1/3 cup glucerna, Wa la, so so good'*), as well as direct postings of, or links to, recipes for diet acceptable meals. These types of informational support were found equally between HAs and participants within the main groups.

Esteem also featured highly, accounting for 29.1% of all supportive messages. Examples of this include *"Hang in there sis, nothing wrong with falling down but its important to get back up. U have come this far and u WILL finish wht u have started"* and *'Every last one of you X and all the others were very brave and you all must be commended. You stuck to the task despite some challenges. Great great'*. Emotional, networking and spiritual support all feature a similar amount (9.3%, 6.7%, 6.3% respectively) with tangible support much rarer at 1.1%, which included offers to share healthy food (*'It taste good do you want some I cook Pot full'*) as well as healthy activities (*'Anyone need to walk on mornings I can accompany you as long as I am off'*).

Classification of support	Church	Church	Church	Church	Church	Church	Total
	1 HA	1 Main	2 HA	2 Main	3 HA	3 Main	
Informational	38	214	5	148	6	143	554
Esteem	20	157	10	91	2	61	341
Emotional	1	13	19	49	0	27	109
Networking	0	15	44	6	0	14	79
Spiritual	8	26	14	11	2	14	75
Tangible	0	0	0	7	0	6	13
Not classified as supportive	437	1199	361	2155	34	419	4605
Total	504	1624	453	2467	44	684	5776

Table 10. Results of classification of supportive messages in the WhatsApp groups of each church

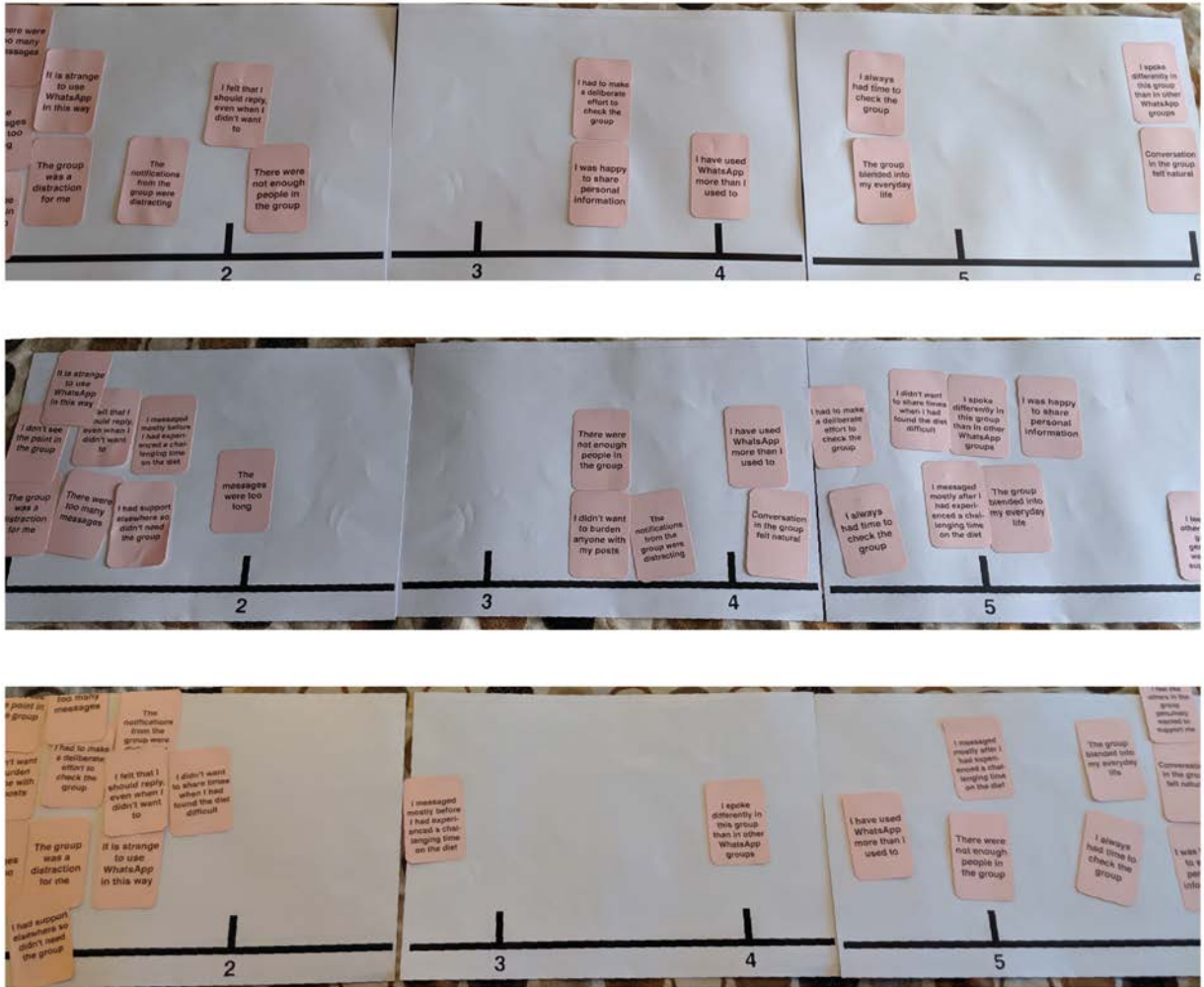


Figure 12. The completed sentiment card Likert scales for the three evaluation workshops

5.4.2 Workshop data

Audio recordings of the evaluation workshops were triangulated with field notes made during the workshops to draw the following findings. A common theme throughout each discussion was the near unanimous praise for social support on WhatsApp. Both HAs and participants referred to the value of 'checking in to see if anyone needs help' and spoke of the 'camaraderie and support'. Of particular note was the strength of agreement with statements such as 'I feel like others in the group genuinely wanted to support me' and 'conversation in the group felt natural'. Although a lot of this enthusiasm could be attributed to the value of peer support in general, many also commented on the ease in which WhatsApp fitted into their everyday

lives: *'It was just natural', 'I have a family chat too, and it's the same thing'* and *'it blended in as you checked it when you wanted to check it'*. This last quotation is particularly significant, as it also points to how HAs and participants tailored their use of WhatsApp to suit their availabilities and commitments. For example, some *'muted' the notifications on the group 'I muted it, I would check, but I muted so I didn't get any notifications'* and *'I do that [mute] for most of the groups on my phone, if I find it going off too often, and then I check when I get the opportunity to'*. Similarly, one participant reported a preference for communicating on WhatsApp *'I prefer WhatsApp, I prefer to type before I speak!'*

The results of the sentiment card Likert scales (see figure 12) also paint a pretty positive picture. Although the true focus of this activity was as a prop for the generation of discussion data, (and not as a separate source of quantitative data), we can still see however the strength of feeling attributed to some of the sentiments. For example, *'the group blended into my everyday life'* was rated as 5 or above in all three groups (where 6 constitutes strong agreement), *'conversations in the group felt natural'* also received scores of 6, 6 and 4. On the other side of the scale, cards like *'It is strange to use WhatsApp in this way', 'I don't see the point in the group'* and *'there were too many messages'*, all unanimously scored 1, indicating strong disagreement. From this it is reasonable to report that the HAs and participants all felt that the peer support system closely matched to their everyday lives in a way that was unburdensome and familiar.

One negative that emerged in the workshop discussions was the challenges of encouraging sharing of moments of failure within the group: *'Sometimes you had to pull it out of them, not everyone was happy to share that information'* and *'you had to really get them to open up and share, and its only when people started to share their experiences, that others started to open up'*. This possibly explains the relatively fewer counts of emotional support found within the chat transcripts. One HA offered an explanation: *"I think what they mistook it for... they saw it as a personal attack on them, instead of seeing the importance of sharing. ... This person trying to get information out of you and you feel a little embarrassed or ashamed cos you did this. And so it looks as though the person is hammering in on you, but really and truly we're*

just trying to get the information so in the future it can assist those that will be doing the study also.”

Another interesting finding from the workshops, was the prevalence of individual, one-on-one messaging outside of the main groups. Participants in all the workshops reported extensive WhatsApp messaging of peers to discuss things ‘*you didn’t want to talk about in the group*’ and to ask more sensitive questions to HAs. Although it is impossible to quantify how much messaging took place, from the discussion it is clear that it was at least comparable to the quantity of messages sent in the main groups. Perhaps unsurprising for a cohort of participants who knew each other outside of the peer support group, the content of these messages was reportedly both for peer support and general conversation.

5.5 5 Discussion

5.5.1 The Character of Peer Support on WhatsApp

Although all types of support were identified in the WhatsApp messages, informational support was still the most frequent type. This is in line with findings from previous design phases where informational support was prioritized by HAs as a way of providing peer support. However, there is evidence that my attempts at widening the types of support through the workshop and instructional resource did have some effect. For example, esteem support was also widely identifiable within the groups. In the evaluation workshops, the majority of examples of supportive messages read out in the first activity workshop were also of the esteem type, further demonstrating a widening of notions of support from earlier design phases. I can attribute this in part to the workshops I delivered in phase 2, as well as the resource booklet, with one participant commenting “*As soon as we had the training in what we were doing, then it became more comfortable, more natural, to speak to the person*”. Tangible types of support were by far the lowest type identified within the data. An explanation of this could be that as participants were meeting regularly in person on Sundays at church, any expressions of tangible support most likely took place there and so were not evident in the data.

In terms of the character of the conversation within the WhatsApp group, findings from the evaluation workshops clearly indicate that the participants felt that the support shown was both authentic and naturalistic. This was particularly evident in the placement of statement cards within the Likert scale activity. The nearly unanimous strength of agreement with statements related to naturalness of communication and 'fitting into everyday life', clearly show the ease in which participants and HAs engaged with WhatsApp as a peer support mechanism. Although this can be partly attributed to the fact that some of the participants were familiar with each other before the start of the study, I can also attribute this to the use of a social media technology that the group were already very familiar with using, and communicating through.

The evaluation workshops also brought to light the prevalence of one-to-one messaging outside of the groups. Although this was encouraged within the resource booklet in the form of 'break out groups', discussion within the workshops suggested that these were generally more ad hoc and informal than suggested in the resource. Although difficult to quantify, it is reasonable to assume that establishing a WhatsApp peer support group may have increased the amount of one-to-one support messages between participants. This is likely as explicitly framing WhatsApp as a peer support mechanism, putting participants in a group with a clear supportive 'mission statement' (Kraut & Resnick, 2018), and framing their contact with each other as a form of support led to two things. Firstly, it normalized social support as something that can be enacted through WhatsApp. Secondly, it actually created connections between people which may have not existed before, the basis of which were clearly foregrounded in notions of support. Both of these factors increased the likelihood of this type of messaging. In this way we can see the prevalence of one-to-one supportive messaging as a beneficial side effect of the intended design.

The evaluation workshops also identified that some participants were reluctant to share their lapses and failings with the diet. This predisposition not to share 'negative' self-disclosure on social-media is relatively well documented. For example, Ma et al. (Ma et al., 2016) discovered that across a variety of social media configurations (e.g. with friends or strangers, anonymous

or identifiable) that *'people are less likely to share items with negative valence than positive'*. This is consistent with other findings into what is deemed appropriate to share on Facebook (Bazarova, 2012) and studies within clinical psychology as to variables that affect the appropriateness of self-disclosure (Chaikin & Derlega, 1974). Ma et al. discovered that this effect is minimized in settings with complete anonymity. In terms of the model, this can be understood in terms of representation of activity. In the peer support system, all activity from participants was personally identifiable to other participants, most of whom they knew well in their real lives. This undoubtedly had an inhibiting effect on self-disclosure of moments of failings. In future iterations, the model should be used to identify opportunities for anonymous self-disclosure (e.g. through a separate channel) to minimise this effect.

In understanding the behaviours here, it is worth revisiting the concept of 'context collapse' introduced in Chapter 2. Both the lack of 'negative' self-reporting and the high quantity of one-to-one messaging can be understood in terms of techniques used to deal with the complexities of online communication where multiple audiences are collapsed into one and where *'individuals only post things they believe their broadest group of acquaintances will find non-offensive'* (Marwick & Boyd, 2011). In this case, those more controversial topics were likely discussed in the more navigable context of one-to-one messaging.

5.5.2 Unplatformed Design as a Design Process

This chapter has detailed a design process, from start to finish, of a peer support system that is based on an existing social media technology. The findings have shown that the system facilitated the expression of authentic, naturalistic peer support, in a way that blended into everyday life. In an immediate sense, this acts as a response to the gap identified in related literature on methods for designing effective peer support systems. However, more can be said about the unique characteristics of this design process in respect to how it was informed by the model of unplatformed design.

I make the claim that the successes of the peer support system in facilitating authentic communication and fitting into the everyday lives of participants, were directly contributed

to by the unplatformed design model. Where the model added most value to the design process (over a typical user centered design process for example) was in its focus on the materiality of social media. Specifically, in bringing to attention the material qualities of WhatsApp that can be configured and/or augmented to affect different qualities of participation. To name a just a few examples of this: when I considered different options for the morphology for the peer support system to determine what group size and composition would work best; when identifying how existing roles within BDRS2 (HAs) could be transferred and sustained within WhatsApp through administrative privileges and soft augmentation of role; when designing the types of peer support activities that take advantage of the multimedia affordances of WhatsApp; and when designing a way to export WhatsApp data in a manageable and secure way. In this way the model acted as bridge between an understanding of the community of participants and an understanding of how a peer support system should be enacted on WhatsApp for that community. It acted as the 'connective tissue' between the two in a way that remained responsive to the needs and capabilities of the community, and sensitive to technical possibilities (and constraints) of the features and affordances of WhatsApp.

Reflecting on the design process, it is clear that the model of unplatformed design contributed most significantly at two different stages and in two different ways. Firstly, the material qualities of the model directly informed the content and activities of the design workshop in phase two. Here thinking of WhatsApp in terms of morphology, role, representation of activity and permeability allowed the formulation of lines of inquiry directly related to these qualities. This took the form of questioning around the acceptability of different possible configurations and augmentations of the material of WhatsApp, allowing for the building of a more holistic view of the relationship between the participants, peer support and WhatsApp.

Secondly, the model was used in translating insights from the design phases into design decisions. For example, the understanding that some HAs were not confident with some of the more advanced features of WhatsApp was directly translated into decisions around the

configuring and augmentation of each of the material qualities. For example, it led to the soft augmentation of a specific social media leader *role*; the extension to the *morphology* of the system in the form a configuration of a group specifically for that role and the research team (see figure 10); the responsibility of exporting WhatsApp data by this role as an example of hard augmentation of *permeability*; and clear communication to the rest of the participants of the purpose of that role and of the exports in terms of *representation of activity*. Working through each insight in relation to the aspects of the model, allowed for the values and characteristics of participants that were identified within the workshops to be embedded throughout the final design.

Another example of where insights generated through the design phases was translated into decisions around the configuring and augmentation of WhatsApp can be seen in the HAs. The HA team were evidently highly motivated towards the role of providing support and very comfortable communicating and delivering this in groups, although early discussions had revealed that they had a relatively narrow concept of types of care (primarily informational). This led directly to a relatively simple *morphology* which could be dynamically expanded (through break out groups etc.) as and when the HAs felt it appropriate. Furthermore, it required a significant soft augmentation of *role*, in the form of training workshops in phase 2, and through the production of the HA handbook. The handbook also constituted a soft augmentation of *representation of activity* in terms of the encouragement to use a variety of multimedia formats and the suggestion of different types of activities that the HAs could do. Lastly, as the HAs all expressed comfort at finding and disseminating informational resources, all that was required in terms of *permeability* was encouragement for this sharing to take place. Again, insights into the community of HAs, when systematically combined with the unplatformed design model, allowed for the strengths and weaknesses of HAs to be responded to by the final design.

This is what I see as a core strength of the unplatformed design process, as opposed to an attempt to design a peer support system on a bespoke application. It made it easier for me to understand the relationship between the material qualities of WhatsApp, the

characteristics of participants and HAs, and the requirements of peer support, in a way that blended into everyday life as it was acutely responsive to the very specific context of this study. Additionally, the final peer support system may have had a relatively simple structure (compared with WhatFutures for example), but that this is a result of a design process which led me, systematically to a simpler design. Upon reflection, a more complicated design, with more moving parts would have risked being ‘over-engineered’, increased work and care burdens for participants and ultimately not been as successful in maintain substantive digital peer support.

However, my reflection on the design process also identified a number of things that were not explored by the workshops and which would have given more insight. Firstly, my discussions focused exclusively on participants and HAs relationship with WhatsApp and peer support, and did not consider the other actors in the intervention who were delivering the clinical aspect of BDRS2. For example, the presence of clinical professionals within the group, even as relatively silent members, led to a deferring of requests for informational support (e.g. questions on what can or can’t be eaten on the diet) to these professionals. This resultingly shifted some of the informational support from being peer delivered to being clinician delivered. This may have stunted peer-ownership of the space (a crucial aspect in community coherence (Preece, 2001)) and likely accounts for the fact that church 3’s main group had far fewer messages overall than the other churches (see table 10), whilst still having a similar count for informational support (comprising ~20% of all messages sent, compared with ~6% in church 2). Another consequence of this is that it can lead to an increase in the work load for those professionals who are members of the group. Professionals may feel compelled to offer assistance and information, this can blur the boundaries between work and leisure time (Chen et al., 2020). From this, it is clear that future unplatformed design processes for peer support should consider the presence of all actors within an intervention, and design to incorporate (or exclude) appropriately.

Other elements not explored by the design process are the challenges associated with new members joining the groups, due to the rolling recruitment model of BDRS2. Although this

did not occur during the three-month deployment covered by this chapter, intakes of new participants into the groups at different stages of the diet, do present challenges around onboarding, group stability and group purpose (Preece, 2000; Kraut & Resnick, 2018). Although these challenges are addressable, the use of unplatformed design model did not initially consider these longer-term temporal factors, instead focusing on the immediate concerns of onboarding and preparing for the start of the BDRS2 study. As such I recommend that future applications of the model take better account of the dynamic nature of communities and contexts, when relating these to the material qualities of social media technologies. For example, this may involve the creation of specific roles responsible for onboarding new members (*role*); presenting 'example' messages from established members in order to establish community norms and behaviours (*representation of activity*); or even the creation of new groups specifically for participants at different stages of an intervention (*morphology*), to name just a few possibilities.

5.6 Chapter Summary

In this chapter I have presented a detailed account of an unplatformed design process for the creation of a peer support system for the Barbados Diabetes Reversal Study 2 (BDRS2). The process consisted of three phases, phase 1 consisted of an initial focus group for needs elicitation and context gathering; phase 2 consisted of a series of training, sensitizing and design workshops; and phase 3 consisted of the design, deployment and evaluation of the peer support system and accompanying materials. I have described how each phase of this process was informed by the unplatformed design model's descriptive and pragmatic utility, as well as how thinking in terms of material qualities allowed for a thorough discussion of the design space for peer support within this context and for the translation of insights generated in this discussion into the final design. I have presented an evaluation of the system, based upon a series of workshops with participants that focused on the lived experience of using the system by participants and health advocates on BDRS2, with a particular emphasis on authenticity and naturalness of communication. Finally, I have argued that the unique characteristics of the unplatformed design model contributed to creating a peer support

system which was responsive to the needs of the community using it, and to their existing usage and experience of social media technologies.

To further investigate the utility of the unplatformed design model the following chapter details another application, but within a completely different design context, namely, language learning within higher education. The next chapter investigates the model's potential for generating deep insights and a fine-grained understanding of the use of social media, within the language educational context, to inform the design of a peer learning system. Later, a more detailed discussion of the practical application of unplatformed design within the design processes for both BDRS2 and language learning can be found in chapter 7, along with discussion of the consequent implications.

Chapter 6 “*Social Media is Their Space*”: Student and Teacher Use and Perception of Features of Social Media in Language Education

In this chapter I give an account of an application of the unplatformed design model within the context of language education. A version of this chapter was published in *Behaviour and Information Technology*¹⁰. I was responsible for concept, study design, data collection, data analysis and writing of the entire paper. Ahmed Kharrufa and Jieun Kiaer assisted with data collection, study design and provided feedback on drafts. Jieun Kiaer also was responsible for participant recruitment.

Whereas in the previous chapter the *pragmatic* utility of the unplatformed design model was explored (through its employment within a multi-phase design process) this chapter examines its counterpart, *descriptive* utility, that I introduced and began to explore in chapter 3. This chapter involves an application of the model that is focussed on generating an understanding of social media technologies within language education. This understanding emerges through an application of the unplatformed design model and is expressed in the terminology of the model. In this way the use of the model is not productive towards a new system, but instead towards a rich description of the underlying perceptions of, and attitudes towards, social media within language learning and teaching. I chose the domain of language education thanks to opportunities that emerged in the course of my PhD; because it was different from that of the previous chapters. So I could further test the validity of the model across disparate civic domains; and because social media use within education is a perfect example of mixture of ad hoc practices (Manca & Ranieri, 2017; Greenhow & Askari, 2017).

¹⁰ The published version of this chapter is: Daniel Lambton-Howard, Jieun Kiaer, and Ahmed Kharrufa. “*Social Media is Their Space*’: Student and Teacher Use and Perception of Features of Social Media in Language Education.” In *Behaviour & Information Technology*. 40, 6. 2020

Many previous studies have looked at the use and adoption rates of social media in language education, but there is little insight into how social media may be deliberately appropriated for education. Correspondingly, studies that take a more fine-grained understanding of the differences between individual features of social media and how they are perceived by learners and teachers are rare. This chapter responds to this by applying the unplatformed design model to examine surface usage patterns and corresponding perceptions of social media in order to generate design recommendations for its incorporation into language learning. This study took the form of two workshops at the Oriental Institute, within Hertford College, Oxford University. One workshop was with learners of languages and one with teachers. In these workshops, the unplatformed design model was used to frame and prompt participant to discuss their use of social media in terms of individual features and services, as well as their assumptions and perceptions regarding their use in language learning, teaching, and generally.

My analysis of usage patterns identified that although there is no real difference between how teachers and learners use social media in their everyday lives, there is a disparity between how learners are using social media for learning and how teachers are using it in education. In order to identify opportunities and risks of incorporating social media that lie beyond issues of the provision of technical resources and staff training, I performed an inductive thematic analysis of the workshop data. I formulate the results of this analysis into three themes: *social media as distinct language type*; *social media requiring a navigation of appropriateness*; and *social media allowing for the prioritization of authentic communication flow*. These themes are then used as the basis for a set of four design considerations for the incorporation of social media in language education that I hope will act as a guiding foundation for future work. Finally, I reflect upon the application of unplatformed design model within this process, and identify how it contributed to the design of the workshops as well as the formulation of these design recommendations. This discussion is continued and expanded on later in Chapter 7.

6.1 Related Work

In January 2019, 3.484 billion people globally were classified as active social media users (45% of the world's population) (Kemp, 2019), and it is becoming commonplace to use communication apps like WeChat and WhatsApp to communicate with employers, colleagues, teachers, friends, businesses, doctors, and more. It is understandable that knowing how to communicate effectively through social media is increasingly acknowledged as being a vital part of linguistic competence. At the time of writing, the global Coronavirus pandemic, which has forced many millions to adopt social distancing and quarantine measures, has further highlighted the importance of communication apps and social media. Despite this, the teaching of social media and the incorporation of social media into teaching practice is still in its infancy, even in fields where it may offer significant contributions, such as language learning. Nevertheless, it is clear that students of languages are turning to social media of their own initiative to immerse themselves in the culture and social media communication of their learned language.

As research in computer-assisted language learning has shown, social media potentially offers benefits for language learning when integrated into curricula (Toetenel, 2014; Manca & Ranieri, 2016; Greenhow & Askari, 2017). Social media could be an excellent platform to complement classroom methods in terms of delivering complex socio-pragmatic knowledge through spontaneous interaction with people of different age and social status. However, different social media sites and applications offer very different features and services (e.g. text, audio, video messaging, and calls), and offer different possibilities and opportunities for configuration and augmentation. Whilst this means that social media language learning can provide a tailor-made platform to meet individual learners' needs and fit with individual learners' preferred style of learning, it also naturally has implications for the effective incorporation of social media into language teaching. This heterogeneity is further compounded by the interrelated issue of how different social medias are perceived and used by learners and teachers. Different applications are associated with different functions (e.g. work, play, socializing) and different sets of interpersonal relationships (e.g. professional,

familial, peers) (Nouwens et al., 2017) which, again, will affect the outcome of attempting to incorporate social media into language teaching.

6.1.1 Social media for language learning and teaching

It is widely reported that social media can have a positive effect within education (Gao et al., 2012; Manca & Ranieri, 2016, 2013, 2017; Rodríguez-Hoyos et al., 2015; Tess, 2013). A study by Gao et al. (Gao et al., 2012) on the use of Twitter point to potential improvements in participation, engagement, reflection, and collaboration in a variety of learning contexts from using social media. Whilst Wang et al. (Wang et al., 2019) link social-interactive engagements on social media to decreasing drop-out rates in MOOCs. In addition, Manca and Ranieri's (Manca & Ranieri, 2016) study on Facebook within education highlights a number of features of the social media platform that could be used to broaden learning contexts and for the creation of rich learning resources, whilst at the same time highlighting issues preventing adoption, such as institutional resistance to social media and incompatibility with existing pedagogies.

Research into social media use within language learning contexts has similarly pointed to its transformative potential. In particular Sun et al. (Sun et al., 2017), Zou et al. (Zou et al., 2018) and Eun-Young et al. (Kim et al., 2011) link social media use to increasing student fluency and competence in English as a Foreign Language (EFL). Özdemir (Özdemir, 2017) connected Facebook to an increase in intercultural communicative effectiveness in students. Similarly Peeters (Peeters, 2018) identifies the importance of social media for students to develop their cognitive, metacognitive, organisational, and social functioning; Lantz-Andersson (Lantz-Andersson, 2018) used Facebook to improve student's sociopragmatic competence; and Akbari et al. (Akbari et al., 2015) for student autonomy, competence, and relatedness. Many studies (e.g. (Álvarez Valencia, 2016; Stevenson & Liu, 2010; Lin et al., 2016)) have also looked at the use of bespoke language learning applications and websites, identifying how features aimed at sociability create positive peer-led learning experiences.

Although many studies have understandably focused on the potential for social media to improve language learning in terms of competence, fluency, and cultural/social awareness, there have been fewer studies that look at how social media has actually been configured for use within pedagogies. To highlight the importance of this issue, Manca and Grion (Manca & Grion, 2017) ascribe low participation rates in online spaces to inadequate or unsuitable design principles, such as imbalanced power relations and a lack of authenticity. Paul and Friginal (Paul & Friginal, 2019) identify the differences between asymmetric and symmetric social networks for learners of Chinese in terms of interactions and pedagogical uses; whilst Toetenel (Toetenel, 2014) highlights differences between the features of the major social media platforms and how they can be used as open education resources within the language classroom. More recently, Barrot's (Barrot, 2018) analysis of uses of Facebook as a learning environment for language teaching and learning identified that despite increasing use, many of its features remain to be unexplored, remarking that research into pedagogical uses of Facebook was still in its 'infancy'. Similarly, in an analysis of trends in the design and application of mobile language learning (Hwang & Fu, 2019), Hwang et al. suggest that because of the high reported percentage of mixed results in terms of learning outcomes, it would be beneficial to further explore and clarify the promotive factors, constraint conditions, and applied strategies of mobile learning activities. These studies point to the importance of thinking deeply about the individual features of social media and their implications for the design of language learning pedagogies, one of the key objectives of this work.

Notably, Manca (Manca, 2020) undertook a review of studies to ascertain whether Instagram, Pinterest, Snapchat and WhatsApp have become integral to teaching and learning in higher education, paying particular attention to the pedagogical affordances of the platforms. Most of the reviewed studies detail attempts to incorporate social media technologies in ways that replicate the classroom or lecture hall, and where '*pedagogical affordances like mixing information and learning resources, hybridization of expertise, and widening the context of learning remain largely undervalued and underexploited*'. Further to

this, Manca describes the general lack of concern for the unique affordances of individual social media systems, and correspondingly a lack of understanding of student's perceptions towards them. As they summarise: *'Indeed, each platform needs to be considered as a specific socio-technical system with a range of user affordances and constraints that demand proper consideration when designing learning experiences that employ social media'*. It is precisely this concern that this study seeks to address.

6.1.2 Attitudes and perceptions of social media for language learning

Studies have looked at student perceptions of and attitudes towards social media's use for language learning. For example, (Cooke, 2017; Bennett et al., 2012; Karvounidis et al., 2014) all examine student attitudes towards social media for learning in higher education, whilst Ko (Ko, 2019) looked specifically at student attitudes towards receiving vocabulary feedback through WeChat, reporting positivity towards the timeliness and quality of feedback, as well as increases in overall engagement. In studies of teachers' perceptions of and attitudes towards social media, a general positivity is identified as being undermined by pedagogical and institutional incompatibility. For example, Ajjan and Hartshorne (Ajjan & Hartshorne, 2008) surveyed teachers' awareness of the pedagogical benefits of social media, noting incompatibility with current practices as being the most significant factor for them not being adopted. Manca and Ranieri (Manca & Ranieri, 2016) conducted a wide survey of Italian higher education institutions and also identified a general ambivalence to the adoption of social media, despite a widespread acknowledgement of their potential benefits. Basöz (Basöz, 2016) surveyed EFL teachers and found generally positive attitudes towards social media's potential to develop vocabulary knowledge, create a more relaxed and stress-free language learning environment, and give learners access to more authentic language use.

The above studies into student and teacher attitudes towards social media for learning have primarily focussed on attitudes that affect their adoption and/or perceptions of their utility for education. The findings correspondingly advocate for improvement in support and training in social media for teachers, and increased inclusion of social media in language

learning. Whilst this is undoubtedly important, what is missing is direction on how social media should be configured and augmented so as to be most effectively incorporated into language learning and teaching. As it is clear that different features of social media have different pedagogical implications (Toetenel, 2014; Paul & Friginal, 2019), it is also true that different social media platforms perform very different roles in the lives of teachers and learners (Nouwens et al., 2017). It is these key areas of enquiry that this use of unplatformed design seeks to address, and from which I build design recommendations for how social media may be effectively incorporated into language learning and teaching.

6.2 Methodology

6.2.1 Study design

Two workshops, carried out at Oxford University, are presented and analysed in this study. The workshops were held on campus in 2019 in a school of languages. The first workshop was conducted with language learners enrolled at the university, whilst the second was conducted with teaching staff. For both cohorts, a wide range of ages and experience levels within the context of the university were recruited. As such, participants included undergraduates and PhD candidates, as well as new teachers and teachers who had been teaching for a number of years. For the learner workshop, participants were internally recruited via email and in person in tutorials and lectures. Learners also received a small cash incentive for attending the workshop. Participants in the learner workshop (N = 10) included learners of English, Malay, Korean, Cantonese, Mandarin, Bengali, Urdu, Japanese, Spanish, and French, and although data was not captured on this, were composed of a variety of nationalities. For the teacher workshop, participants were recruited through face-to-face meetings, as well as through email and posters in staff areas. Participants in the teacher workshop (N = 12) included an even wider range of learned languages, and included staff who had been teaching around 1-2 years up to those who had been teaching ~20 years. Both workshops were audio recorded with consent, and then transcribed for analysis. Additionally, two supporting researchers present in the workshops took field notes of observations.

Both workshops involved the use of a bespoke set of cards to help frame and guide discussion around the individual features of social media. I created these 'feature cards' to represent the specific features of social media, as well as to provide guidance examples for each (see figure 13). Although existing typologies of Web 2.0 tools do exist, for example in higher education (Conole & Alevizou, 2010), I wanted the categories to be focussed on specific features of social media technologies and to be immediately understandable by participants, requiring little or no further explanation and avoiding confusion or misinterpretation. Conole et al. rely on Crook et al.'s 2008 typology (Crook et al., 2008) which proposes the following categories: media sharing; instant messaging, chat and conversational arenas; online games and virtual worlds; social networking; blogging; social bookmarking; recommender systems; wikis and collaborative editing tools; and syndication. While some elements between their typology and mine are shared (e.g. instant messaging), others such as 'media sharing' and 'social networking' are too general and do not go into the specific media types as categories (e.g. video, audio, and text) and nature of communication (e.g. video call vs video message), or are beyond the scope of the platforms intended to be covered in this work (e.g. wikis, blogging, recommender systems). Furthermore, they do not go into recent, yet important additions to such platforms such as chatbots. To this end my categories were established by looking at the primary features of the most popular social media networks and applications used globally, as aggregated from [statista.com](https://www.statista.com/statistics/272014/global-social-networks-ranked-by-number-of-users/)¹¹. 10 cards were created in total (see figure 13), consisting of *direct text message, audio message, audio call, video message, video call, stories, comments, chatbots, feeds, and game playing*. Blank cards were also provided in case participants wished to add their own.

¹¹ <https://www.statista.com/statistics/272014/global-social-networks-ranked-by-number-of-users/>

 Direct Text Message (e.g. WhatsApp, Messenger)	 Audio Message (e.g. WhatsApp, Messenger)	 Audio Call (e.g. WhatsApp, Skype, Messenger)	 Comments (e.g. Instagram comments, subtweets)	 Chatbots (e.g. Messenger, Slack, Twitter)
 Video Message (e.g. WhatsApp, Messenger)	 Video Call (e.g. Skype, WhatsApp)	 Stories (e.g. Instagram stories, Snapchat stories)	 Game Playing (e.g. Duolingo, Memrise)	 Feeds (e.g. Facebook, Twitter, Instagram)

Figure 13. Feature cards used in the learner workshop.

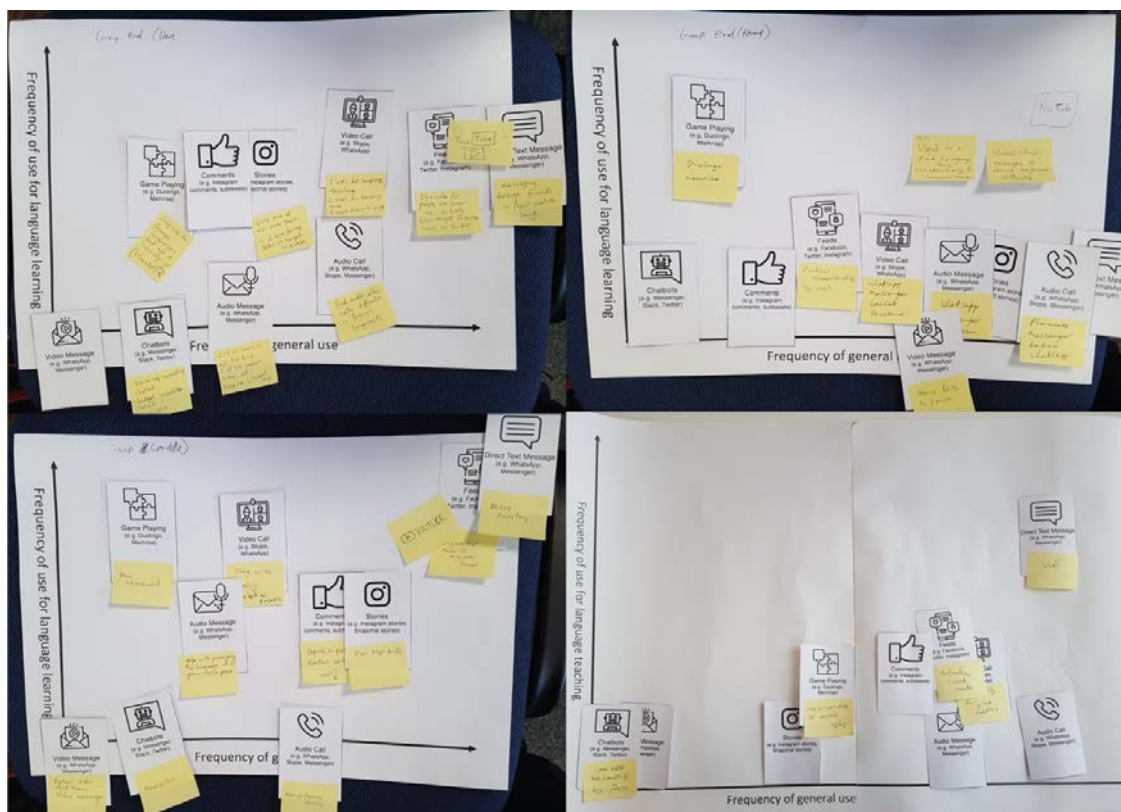


Figure 14. The completed feature graphs from the learner's workshop and the teacher's workshop (bottom right).

The workshop with language learners included two activities and took around 2 ½ hours each. After an initial icebreaker introduction, the first workshop activity involved using the feature cards to prompt group discussion and reflection on each feature with regards to their usage in everyday life and in language learning. Participants were split into three roughly equal groups, each observed by one of the three researchers present, and were given a full set of 10 cards. Each group was also given a board showing a blank graph with two axes labelled '*Frequency of use for language learning*' and '*frequency of general use*'. The axes of the graph were not given numerical values to encourage more descriptive discussion of their placement (to avoid discussion along the lines of '*I think this is a 4... no I think it is a 5*'). All participants were told that the top end of each axis represented using a feature every day, whereas the bottom end of the axis represented never or very rarely using a feature for that purpose. Within each group, the cards were dealt out between the participants. Then, taking it in turns, a participant would read aloud the content of their card to the group, after which the group discussed where that card should be placed on the board with respect to the two axes, with higher up the vertical axis representing increased usage of that feature for language learning, and further along the horizontal axis representing increased usage of that feature in general use (for example, a feature card placed in the top rightmost position on the graph would indicate a daily use both generally and for language learning). Groups were also encouraged to annotate their placement with additional details. Once all cards had been placed, the groups were brought together to discuss differences and similarities between their placements. See figure 14 for the completed feature graphs.

The second activity in the learner workshop involved the simulation on social media of an unplanned 'formal' learning task followed by an unplanned informal general task. I chose simulation activities in order to better frame discussions around the specifics of using social media in a language learning context. Similar to the use of WhatsApp in WhatFutures I designed the first task as taking place on a WhatsApp group containing 3-4 participants, each with a specific role to play in the task. Participants were grouped by their learned language

and placed in a shared WhatsApp group chat using their own devices (phones were provided for any participants who did not bring theirs). Each participant in the group was then assigned one of the following roles.

- ROLE 1: Choose a topic of your choice and post in your group a short (30sec) audio message in your learned language about your topic.
- ROLE 2: Listen to the audio message in your group, and have a text conversation with role 3, in your learned language, about that topic.
- ROLE 3: Listen to the audio message in your group, and have a text conversation with role 2, in your learned language, about that topic.
- ROLE 4: Read the exchange between roles 2 and 3. Give your feedback on the conversation.

For the informal task, participants were asked within their group to simulate arranging to meet up for a social event (no more specifics were given than this). This simulation took place in the same WhatsApp group chats, but did not include the use of roles or any explicit learning process. Afterwards the groups were brought back together to discuss the activity and reflect upon both the formal and informal simulations.

The workshop with language teachers also contained two activities, and lasted 2 hours. The first activity used the same set of feature cards (figure 13) and blank graph as the first activity in the learner group. The only differences were that the language learning axis was relabelled as 'language teaching', and the language teachers were not divided into sub-groups (in the interests of time). This activity was designed to be as similar as possible to the learner workshop so as to give directly comparable results. For the second activity, since participants were teachers and not learners, rather than recreate a simulation of a learning activity, I instead presented the teachers with 'insights' generated from the simulation activity in the learner workshop. These insights took the form of quotes taken from transcripts of the first workshop that contained explicit reference to incorporating social media into teaching practices. They were used as prompts to kick start wider discussion on the implications of using social media technologies in language learning education.

6.2.2 Data and analysis approach

Data gathered within the workshops consisted of observation notes made by myself and the other two researchers present, the finished graphs from the card-based activity including participant annotations, and audio recordings of all discussions. I consider the primary data source from the workshops to be the audio recordings of the group discussions. Group discussions were held in both workshops after the feature graphing activity, and after the learner simulation or teacher 'simulation insights' activity. Audio was transcribed for thematic analysis (a sample transcript can be viewed in appendix D.2). Analysis aimed to follow Braun and Clarke's (Braun, 2006) method for thematic analysis, focusing on both semantic (surface meanings) and latent (underlying ideas or assumptions) aspects of the data. I primarily used an inductive approach, where codes and themes develop from the data content. This meant reading and re-reading the transcripts, then iteratively coding the data, with each pass improving and revising codes throughout the process. Initial coding by myself and a colleague produced codes that could be grouped into five candidate themes: 'social media as a student owned space', 'social media as a distinct language type', 'social media as prioritising communication flow', 'social media as authentic communication' and 'social media as incompatible with existing teaching practices'. These candidate themes were then collapsed into the three themes presented in the results section below, after an initial thematic mapping suggested overlap between one pair of themes ('communication flow' with 'authentic communication') and the removal of 'incompatibility with existing teaching practices' as a theme, as it was discussed primarily in relation to the other themes.

Additionally, both workshops generated data, in the form of graphs, on the usage of the individual features of social media for both language learning and general use. Three graphs were produced in the learner workshop, and one graph in the teacher workshop, which can be seen in figure 14. These graphs took the form of cards representing each feature placed in respect to two axes, referring to frequency of use for language learning and frequency of general use. Although the primary utility of this graph data was its role in prompting and framing group discussion, I viewed the data, along with field notes taken by supporting

researchers, as useful for making comparisons between the learner and teacher groups and for helping us further understand issues and themes identified in the discussion. To analyse the graph data, I divided each axis into 5 equal segments akin to a Likert scale, and gave each card two scores corresponding to its placement on each axis, with higher scores indicating increased frequency of usage. The scores for the three separate graphs generated in the learner workshop were combined and averaged so as to enable direct comparison with the graph generated in the teacher workshop. These scores were then descriptively analysed to draw comparisons between the two groups and two usage types (see figure 15).

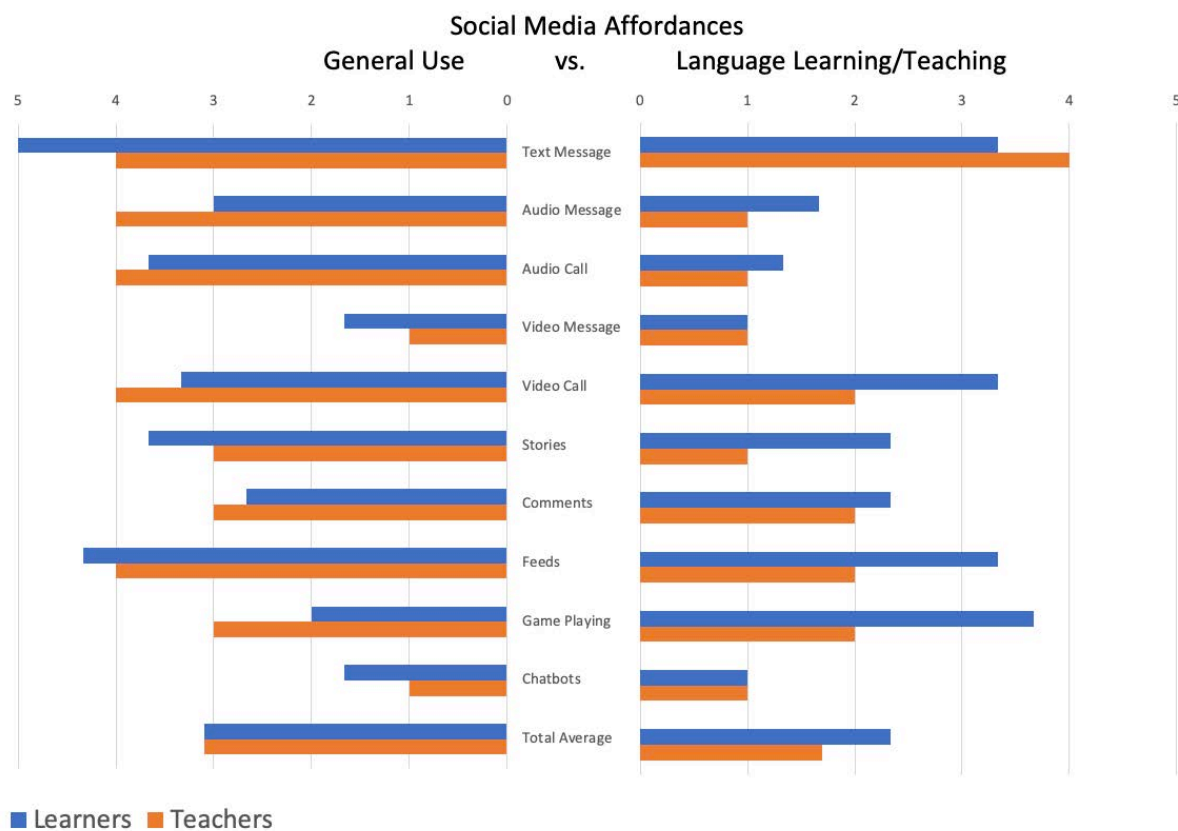


Figure 15. A comparison of use of social media features generally vs. for language learning/teaching in learners and teachers, where 1 = never or rarely use, and 5 = use every day.

6.3 Results

6.3.1 Feature usage graphs

Although the feature usage graphs are considered secondary data, I present them here first as they provide additional context for understanding and interpreting the primary discussion data. Figure 14 shows an example of completed feature graphs for one of the learner groups and the teacher group. The results of individual scoring of social media features in both workshops can be seen in figure 15. From this chart we can see broad similarities between how teachers and learners use social media 'generally', with an identical average frequency score. This is different with social media use for language learning, where the trend is that learners reported using social media features for language learning more frequently than teachers reported using them for teaching. This points to language learning on social media being primarily an informal learning experience, which is corroborated by the analysis of the discussion data in the following section. In respect to the individual features of social media, the greatest difference can be seen in learners' use of *video calls*, *stories*, *feeds*, and *game playing* for language learning, which were all over 1 point higher than their equivalent use in language teaching. All features were rated as being used for learning more than they were used for teaching, with the exception of *text messaging* which was reported as slightly more (<1 point) frequently used for teaching than learning, and *video messages* and *chatbots* both of which were scored identically as rarely used in either learning or teaching. Once again, I stress that the analysis of this graphical data is not intended to be generalized across populations due to its small sample size and non-use of statistical methods. Instead it is presented to add more description to the participants' self-reflection on their own social media usages, and as an accompanying description to the analysis of the primary discussion data source which follows.

6.3.2 Themes from analysis of discussion data

I generated three salient themes related to use of social media for language learning within the discussion data set: *social media as distinct language type*; *social media requires a navigation of appropriateness*; and *social media allows for the prioritisation of authentic*

communication flow. I present these now. In the following subsections, extracts of the data are presented to both act as exemplars of data within the themes, but also analytically, where aspects are discussed in more detail. In order to keep the narrative flow of the results, I will be discussing some of the results as I present them. This is in keeping with Braun's recommendation for the presentation of thematic analysis results: *"Extracts need to be embedded within an analytic narrative that compellingly illustrates the story you are telling about your data, and your analytic narrative needs to go beyond description of the data, and make an argument in relation to your research question."*(Braun, 2006)

Theme 1: "it's quite a vital skill nowadays" - social media as a distinct language type

The first theme captures the perceived importance of social media as a crucial skill in language learning and language development. This sentiment was expressed by both learners and teachers alike, frequently in reference to the ubiquity of social media in modern life, and to the unique modes of communication that are afforded by it. A number of learners made statements similar to the following:

"... I think that messaging is a skill in its own in the same way that when you're learning a language, you might have a letter-writing class where the task is 'Write a letter to your friend.'. I think it could be useful to, like... cause you never get taught how to text in your target language, that might be quite interesting to be like, 'Okay, today's class, we are going to use WhatsApp, and we are going to pretend that we are organising something.'..." (L5)

Here the participant expresses two key points. The first is that communicating via social media is conceived as a distinct form of communication, different from other forms of communication (e.g. letter writing). Learners referred to the use of slang words, emojis, and stickers specific to social media in certain languages and cultures. Social media was also described as having a unique etiquette associated with it: *"what is the 'etiquette', in, in, communicating in texts?" (L1)*. This further emphasises the uniqueness of social media as a particular form of communication. Secondly, for the participants at least, social media was a

communication form that was not currently being taught, with learners expressing a desire for this to be otherwise. Although the primary motivation for this was the prevalence and primacy of social media communication in everyday life, there was also a particular emphasis on avoiding embarrassment or social awkwardness with peers and speakers of that language.

“I think it’s quite a, it’s quite a vital skill nowadays. Like, especially, if, if you are going to Japan and trying to make Japanese friends, they’re going to want to add you on one of the messaging things, and then it’s feels, it feels, it would feel really embarrassing if you could talk to them very well, but then you don’t really know how to communicate with them...” (L1)

“Yeah, sounding really dumb cause you only learned formal form, and your friends are like, ‘Why are you talking to me like we’ve never met before?’. And your boyfriend’s like, ‘Why are you being so cold?’. I just can’t use any other forms. ‘You sound like my professor.’” (L2)

This desire to learn how to use social media properly was recognized by the teaching participants. A few teachers gave examples of the types of questions their students had asked them around social media, particularly in reference to learning slang terms, which all teachers agreed was important to learn.

“...there was this lovely girl in the classroom saying, ‘can I prepare a list of swear words?’... [Laughter] ... So basically, the student initiated that and I had a quick look and, wow! Yes. But they wanted to have that input, so yeah, I let it happen and I told them, ‘promise me not to tell anyone’. So ... maybe it is important because they want to know if people say bad things to them...” (T8)

“They need to. They need to know yeah. They need to know.” (T9)

“How they think is a part of their lives. So maybe we have to learn. Yeah, these Japanese people are using it all, then Japanese students should understand how to use them right to write like a native.” (T4)

These examples illustrate how teachers acknowledged the importance of their students knowing how to communicate properly with speakers of a language through social media. This is particularly important as social media is incorporated into work and life more generally.

For example, WeChat is a common part of business in China with many small businesses operating exclusively through it. It is increasingly clear that if you cannot use social media, you are not considered fully competent in many languages. However, in respect to informal social media use, there is an uncertainty expressed by teachers as to whether this is something they should be teaching (*'promise me not to tell anyone!'*). Also, before being able to properly teach social media, teachers would have to learn it as well. This sentiment ties into a perception by some of the teachers of social media as being something that is outside their knowledge and/or their remit as educators, which I discuss in more detail in the next theme.

Theme 2: "Social media is their space" – social media requiring a navigation of appropriateness

The second theme captured the idea of social media as belonging to, or being owned by, younger people, and the corresponding need to navigate appropriateness. In the context of these workshops, the term 'younger people' was conflated with the term 'learners', as students are typically younger than teachers within the university the study took place in. The identification of this generation gap was expressed by both learners and teachers, particularly in the context of inhabiting the same social media space for the purposes of language learning. Many learners made statements similar to the following:

"Normally with a tutor, you would use very formal language and that [speaking informally] might not be [comfortable]" (L8)

Overall, communicating with teachers on social media was seen as awkward and unusual. This was primarily attributed to the nature of social media conversations as generally being much more informal than the ways in which learners felt they would be comfortable addressing their teachers. In this way, we can see that learners perceived the introduction of teachers into social media as bringing an unusual dynamic which would disrupt the comfortable flow of communication. This mismatch of formalities was more pronounced in learners of languages with more explicit formal registers (e.g. Chinese, Korean, Japanese). As

suggested by a learner, one solution to eliminate this source of awkwardness could be the use of role-play activities:

“In, in languages like Japanese or Korean where there’s register, it would probably have to be a more kind of role-playing situation where you are allowed to use slightly less formal language.” (L7)

Though this suggestion was also seen as a source of potential awkwardness.

“Yeah, but if it, but if it was in kind of more role-playing, like, ‘Imagine we’re the same age. Let’s have a conversation about this,’ that might be slightly better, but also a little funny. Well, maybe a little bit awkward as well.” (L8)

Clearly the idea of communicating with teachers through social media is considered counter to the natural ways in which learners use social media. In this way, learners are stating (or inferring) the existence of a natural comfortable space that they inhabit in social media, and that teachers, or language learning, exist outside of this. This is in line with Nouwens et al.’s [5] work on communication places in app ecosystems. Communication places refers to the ways in which users create specific membership rules (who they communicate with), perceived purposes (the functions of communication), and emotional connotations around their use of communication apps. Here we can see that teachers are perceived as standing outside of learners’ typical existing understanding of social media as a communication place.

This sentiment was echoed by the teachers, most of whom affirmed that communication between learners and teachers via social media can feel unusual, with some participants stating that the difference in formalities was likely impossible to surpass:

“I think this is a problem for languages that are hierarchical, in the sense that, if that’s a certain culture that requires a respect of elders and people with authority than it becomes very difficult to implement this in the classroom because you’ll be so confused as to how you’re going to address your teacher after that...I really doubt it’s... it could be put into practice. At least, not for the languages that I know... but the casual bit is something that it’s probably a no-no...” (T2)

“The only way that I could actually see this being implemented in real life is if they have people of the same age and they could communicate with them and maybe that’s something that can be facilitated but other than that I don’t know if it is possible for you to have that sort of interaction with your teacher...” (T3)

This issue was further mixed with the complexities of professionalism and appropriate behaviour with some teachers raising uncertainties around what was and what was not acceptable in communication with learners through social media. One teacher raised an example of a colleague who had, in their opinion, crossed this boundary by being Facebook friends with all their students. However not all teachers agreed with this, with one expressing delight at being included in a social media group by their students.

“I use a lot of WeChat because you can’t use Facebook in China... and [my students] even created a group called ‘___ Gang’ with my name.” (T8)

This illustrates that the appropriateness of social media communication between learners and teachers is a grey area without clear agreed-upon boundaries. However, the differences expressed in these two examples further reinforce the idea of social media being seen as a space owned more by learners. The example of the group on WeChat was seen as acceptable as it was initiated by the students themselves; in this way the teacher was ‘brought in’ by the students. This stands in contrast to the Facebook example, where the teacher sought entry to a space which was perceived as not belonging to them.

On the topic of teaching social media itself, (e.g. lessons on how to communicate on social media in a learned language) many teachers expressed that there was no need, or that it was not their job to teach it:

“But would you feel that you need to teach them in a classroom or you could just leave students to, kind of, learn [social media] on their own? They can just do it by themselves.” (T5)

“But as a teacher, I don’t really need to teach them.” (T2)

Here the view expressed is that students will learn how to use social media without teacher guidance, as it is an ingrained part of being a young person: *“because that’s what they do in their private life anyway”* (T2). We can see that these statements are underpinned by the assumption that social media is a space owned by learners; that it is not a teacher’s place to teach social media. This view stands in contrast to the theme reported above where both teachers and learners acknowledged the importance of knowing and understanding social media for language learning.

Theme 3: “Like, it’s more like an immersion than, like, structured learning” – social media allowing for the prioritisation of authentic communication flow

The third theme captures a perception of social media as valuable for facilitating a natural and authentic ‘flow’ of communication. By flow, I am referring to the speed and ease with which communication occurs between users. Individual features of social media were perceived as supporting learners’ abilities to take part in a natural flow of communication in their learned languages, by giving the option to take part in conversations in low risk and low effort ways. Data within this theme operated at various levels, with some participants articulating positive learning experiences from engaging with the flow of social media communication, with others citing it as being ‘overwhelming’ and ‘too much’ to constructively incorporate into learning. One feature of social media that was regularly referred to as key in constructing this flow was the use of emojis and stickers:

“I’ll resort just to, more, emojis and stuff because it was a lot easier to, like, put out there without actually, like, saying anything because (a) I didn’t know what to say, and (b) it was a lot easier to just have a sticker out there saying, ‘Yeah, I’m seeing what’s happening, it’s just that I’m not really in this...’, if that makes any sense?” (L8)

“I would definitely agree with that. If you can’t quite think of how to respond, you could just put a sticker... And then there can still, the conversation can continue on and you’re not always having to go, like, ‘sorry, what was that?’, or like, ‘can you say that in a different way?’” (L7)

The value of emojis and stickers in these examples is seen to be the role they play in facilitating conversation flow. They allowed the learners to participate in a conversation in a low effort and low risk manner that still enabled the conversations to continue. Furthermore, one participant highlighted that emojis and stickers can help with language learning as *“things like emojis help because it relates a sort of, like, visual, sort of, learning aspect”* (L5) referring to the emotional cues that emojis provide as important information that can help in understanding what was meant by an unclear message. This is in line with theory around emoji use generally (Tauch & Kanjo, 2016; Hogenboom et al., 2013) which show that they are often used to provide emotional context to help understanding and to facilitate conversation flow. In contrast to this, some learners felt that simply maintaining a flow of communication was not that useful for learning in a strict sense, for example when discussing using emojis: *“...that makes it easier, whether that means your language gets better or not is completely different”* (L8) and *“Like, it’s more like an immersion than, like, structured learning”* (L5). So, although social media was valued as making it easier to maintain a flow of communication, this was not necessarily seen as valuable in terms of learning the language itself, or as one teacher put it: *“continuing the conversation, if not necessarily grasping or learning words”* (T5). This can be compared with the difference between fluid and accurate learning, where social media immersion may help a learner respond fluently but may not help with accuracy; whereas structured learning can improve accuracy but stunt fluency.

A crucially important feature of social media that emerged through discussion was the ability for learners to choose the communication mode (e.g. text, audio, video) that most closely matched their comfort and ability. When referring to the simulated WhatsApp activity in the workshop: *“...I would, I would, like, if I was recording the messages, I think it would be easier”* (L1) and *“I feel easier via text just because my written Chinese is better than my spoken Chinese.”* (L4) Though similar to the previous point, learners acknowledged that although focussing on their strengths would enable a smoother communication flow, it would be less likely to help them improve their language knowledge. Again, this belies a latent priority for communication in social media to be natural and authentic.

Social media was also praised as being a place where learners could dwell without feeling the pressure to contribute. Allowing them to learn and communicate at their own pace. This was largely attributed to being members of large chat groups, or following lots of speakers of that language on Twitter or Facebook feeds.

“...one of the most useful things that I use for my practising my Japanese is I have, I am part of a group chat of about, maybe, seventy people... who move between Japanese, English, and French... And it does, it does genuinely work because if you have that many people, there’s no pressure to really be in or out... So, I’ve been there since my Japanese was really crap to now, where, like, I can respond relatively okay. Umm... You can allow other people to carry the conversation, but as you also get more confidence and understand more of what’s going on, you can add more in and put more stuff into the group.” (L1)

This experience was echoed by many others in the learner workshop, some of whom were members of similar groups. However, the usefulness of large groups for language learning was contested, particularly when groups get too large:

“I would feel overwhelmed, and I wouldn’t, I wouldn’t want to scroll through and read everyone else’s conversation.” (L4)

“I think, over, over twenty it just becomes almost overwhelm... like, as overwhelming, and you’d just, you’re psychologically, kind of, just, switch off.” (L8)

“I’m in one group that is four hundred, then I’m in, like, two hundred, three hundred... you get all the notifications, eventually you mute them. And, like, if you want to scroll up and see what people have been saying, you can do that, but then, by the time you’d done that, like, there’s a new... ten new conversations would have begun, so there’s really no point.” (L8)

The speed of communication in large groups was also seen as being particularly unsuitable for beginners of a language, who would likely be overwhelmed by the “ping, ping, ping” (L8) of notifications and messages. Another potential barrier for new language learners was access to an existing network of speakers of that language to connect with: “...unless you have an

'in' into those systems, there's no point having those apps if you don't know anyone you could connect with" (L6) and *"generally with things like Facebook or Instagram Feeds, again, it's maybe for the more advanced learner because you would have to know some people to be able to follow their stuff"* (L1). Overall, immersing yourself into large chat groups and filling your social media feed with speakers of your target language is seen as a way of providing low risk access to genuine authentic communication flow at a pace that is determined by the learner. However, these benefits are tempered by being perceived as not being 'real' learning and by problems that emerge from potentially overwhelming amounts of information, such as 'switching off' and disengaging. We have also seen that access to such groups is perceived as requiring a corresponding access to speakers of that language who can bring you into their network, or at least a certain level of language ability before opportunities to engage with target language social media can be identified usefully.

6.4 Discussion

My analysis of the workshop data has surfaced three themes around how learners and teachers perceive the use of social media in language learning: *social media as distinct language type; social media requiring a navigation of appropriateness; and social media allowing for the prioritisation of authentic communication flow*. I intended my approach to 'look past' surface descriptions of social media use and instead focus on latent ideas and understandings of social media. Because of this, I argue that these three themes capture fundamental conceptions of social media use for language learning. This is useful as it allows us to understand the ways in which incorporating social media into language learning can be more (or less) appropriate to the attitudes and needs of both learners and teachers, and more (or less) appropriate to the strengths of social media as a communication medium.

One consistent commonality between the three themes is that of negotiating and navigating the boundaries of formality, acceptability, and appropriateness on social media. Not just in language use, but in how teachers and learners should interact on social media, and through which features. The constant negotiation of these boundaries could be seen as an inevitable

consequence of social media encroaching into more areas of everyday life. As this happens, rules for formality and for what is acceptable and appropriate solidify and become understood. This is exemplified by the widespread and accepted use of WeChat for communication between students and teachers in China. It is important that teachers of languages embrace this change, and embrace the use of social media in teaching and learning.

As an initial step towards formalising this understanding into useful guidance, I have formulated four design recommendations for incorporating the features of social media into the language learning classroom. Specifically, these recommendations are based on material qualities of social media technologies within the unplatformed design model (see chapter 4 for full details). As such they are an attempt to apply the unplatformed design model to translate insights generated from the design workshops into practical guidance on the configuration and augmentation of social media technology. I suggest that the following recommendations will help the design of learning interactions that incorporate social media in order to be more successful, relevant, and engaging, demonstrating the pragmatic utility of the unplatformed design model.

6.4.1 Design Recommendation 1 – Prioritise Representation of Activity that models authentic use of social media

The results of the graphing activities in both workshops show that the individual features of social media are used at different frequencies, and even more so between general use and use for language learning. Each of these features is an example of a different *Representation of Activity*, and as such some are more suited to certain activities than others. For example, the learners in the workshops responded much more positively to the simulation of arranging to meet a friend through group text conversation on WhatsApp, than they did using the same modality for engaging with a set discussion topic (theme 3).

I recommend paying particular attention to the different ways that activity may be represented within social media technologies (e.g. group text, images, video, etc) and modelling the types of learning activities that suit those modes of communication (e.g. short-

form informal communication on instant messaging applications). This is so that the representation of activity more closely maps to real life usage of those platforms, creating opportunities for natural and authentic communication (theme 3) and more closely to actual language use (theme 1). For example, Online UWC extensively configured the group video call feature on Facebook and Google Hangouts (Celina et al., 2016) to successfully simulate a tutorial or seminar style environment, appropriate to the needs of the course, and would not have worked as well using text based communication. In comparison, WhatFutures allowed its learners to contribute in any communication mode they felt comfortable (theme 3), in order to encourage a higher quantity of contributions.

Furthermore, the insight that social media communication is a distinct language type (theme 1) requires an additional consideration of how activity is represented in respect to authenticity and learning. Communication on social media technologies needs to be demonstrated before it can be modelled and learned. Therefore, activities should be configured so as to be visible to other learners, at least in the earlier stages of learning, so that they may learn from each other and tutors. This may require augmentation, in terms of extracting examples of 'good' communication to make them more visible (e.g. classes posting extracts of conversations on a shared document, or a tutor starting with some pre-prepared samples in a group chat)

6.4.2 Design Recommendation 2 – Use Role to create learner-led and learner-owned spaces on social media

The perception of social media as being a space that primarily belongs to (or at least is best understood by) young people was evident within both learner and teacher data (theme 2). Rather than seeing this as a reason *not* to incorporate social media into teaching practices, I recommend instead configuring the material quality of *Role* in social media for language learning in a way that prioritises learner ownership and learner-led processes. There are many positive reasons for doing this. Firstly, minimising teacher presence helps ensure that communication is more natural and authentic between peers and reduces ambiguity as to how to address teachers and people in authority (themes 2 and 3). Secondly, positioning

learners as leaders of social media usage in the classroom recognises and gains maximum benefit from the skills and experience learners already have that can be shared with peers (and teachers). Thirdly, it reduces the burden of teachers needing to be completely knowledgeable about how to use social media, and which platforms to use in learning, and lessens the burden of negotiating acceptable professional boundaries for communication with learners (theme 2). In a practical sense this means configuring social media so that administrative and authorship rights (how social media typically recognizes authority) are genuinely owned by students, and minimising teacher presence within social media spaces. This is in line with research on student-led environments where learners, through peer to peer interaction, become capable of solving problems of their own (Garrison, 2015).

The soft augmentation of *Role*, that is assigning particular duties and functions to learners, is a well-established method within group work (David W. Johnson & Johnson, 1999). This is no different here, where ‘role-playing’ on social media was met largely with positive responses by learners. As long as the learning activity in which roleplay is used is relatively authentic to the representation of activity (see previous recommendation), it could be an effective learning tool, again with an emphasis on learner led interactions.

6.4.3 Design Recommendation 3 – Structure dynamic Morphologies to create pathways toward authentic use of social media

Both learners and teachers agreed that understanding how to communicate on social media is an important skill for language learning (theme 1), and that one of the most educationally rewarding aspects of engaging with social media for language learning is the way it can connect learners directly with speakers of that language and to a constantly evolving source of authentic language learning material (theme 3). As such I recommend connecting learners as quickly as possible with speakers of that language and with learning material. However, there was also an acknowledgement of the high barrier to entry for learners to properly engage with the quality, quantity, and frequency of communication typically found on social media (theme 2). As such I recommend the creation of structured pathways of social media use that begin with safe spaces to practice, using peer-sourced and peer-generated learning

material from social media (i.e. student led spaces in recommendation 2), moving through to genuine interaction with speakers of that language on social media. In practical terms, this may involve the creation of a dynamic *morphology* of different groups. For example, an initial set of smaller interconnected groups that connect beginners with advanced learners, and the sharing of content from social media. Activity wise, this could take the form of a rotating discussion of found articles, interesting threads or media to watch. At alter stage, the morphology could be adjusted so that learners naturally graduate to larger and more organic groups, such as the large ones described by participants in theme 3. Here they could communicate in a manner comfortable to them (theme 1) with speakers of that language.

In general terms, the configuration of morphology (e.g. size and interconnectedness of groups) has a direct impact on the quantity and quality of communication, and correspondingly on the level of challenge, of engaging with others. It is likely that different morphological structures will be required for different levels of learners. Similarly, the type of connection between people within the morphology (e.g. reciprocal friendship, one-way follow etc.) also affects the expectation of communication. Following someone on Twitter for example, has a much lower expectation of communication than being within a WhatsApp group, or even friends on Facebook, and may therefore be more suitable to early learners.

6.4.4 Design Recommendation 4 – Plan for Permeability in incorporating social media in both traditional and new methods of assessment

The perception of social media as being incompatible with traditional teaching methods came across clearly in the related work (Ajjan & Hartshorne, 2008; Manca & Ranieri, 2016), and throughout the workshop with teachers. Despite this, there is strong evidence in the data (theme 1) that social media is perceived by both learners and teachers as crucially important for modern competency. As such, I argue that social media should be included in assessments, which may also alleviate some teachers' concerns that if something is not assessed it will not be engaged with. Incorporating social media into assessment has a natural tie to the *permeability* of social media technologies. This is because being able to input and output information (possibly at scale) will likely play a part in the setting of and evidencing of

assessment. Within smaller cohorts of learners, it may be feasible for assessors to use the general methods for inputting and outputting of a social media technology, such as typing text, uploading images, or soft augmenting by copying and pasting information into and out of an app, however this is clearly impractical at scale. Therefore, I recommend the creation of tools that interact with application programming interfaces¹² of social media technologies (where possible) to automate and make consistent the posting and retrieving of information. One solution may be the creation of bots or Klopfenstein et al.'s 'botplications' (Klopfenstein et al., 2017) which act as consistent conversational agents within a social media technology. These automated chat agents are interacted with in natural language (e.g. sending through sending direct message on WhatsApp as opposed to computer code), and could provide rich and varied stimulus for learners to respond to, provide automated feedback, and could potentially also automate and process data for assessment.

In terms of the activity to be assessed, these could be as simple as including elements that directly address the use of social media (e.g. correct ways of ordering products from a shop using WeChat or arranging to meet friends at a restaurant). However, I also recommend looking at alternative ways of assessing social media learning. One possibility is the incorporation of peer assessment, this is in line with design recommendations 1 and 2. The many other benefits of engaging with social media (beyond academic credit) also need to be highlighted and strengthened (if they are not already evident). These strengths include, as evidenced by the data, meeting and interacting with speakers of that language, interacting with real source learning material (as opposed to textbook material), and learning how speakers of that language authentically use the language informally. Creating ways for

¹² A computing interface which allows for two pieces of software to programmatically interact with each other, e.g. for automation and/or information requests at scale.

learners to discover and share these insights with each other may work to encourage learner engagement with social media.

6.4.5 Limitations

Although this study has surfaced a number of latent perceptions towards the use of social media in learning and teaching languages, it does present a number of limitations. Firstly, the small sample size (10 learners, 12 teachers) along with the homogeneity of all belonging to the same higher education institution does present a challenge in terms of the generalization of these results. Although the results yielded by thematic analysis required an in-depth analysis of discussion data (a process that does not scale well), I acknowledge that similar studies with alternative populations may yield differences in perception. Future work with different educational contexts, sample sizes, and cultural/societal backgrounds will help to alleviate the difficulty in generalizing these results, whilst increasing the depth of knowledge of perceptions of teaching and learning languages with social media. Furthermore, my design recommendations, although informed from successful uses of social media appropriation in education, require testing and validating. This is my intention going forward beyond this thesis.

6.5 Chapter Summary

In this chapter I have presented a study that applied the unplatformed design model to translate insights into usage patterns and perceptions of social media in teaching and learning languages into design recommendations. My analysis of usage patterns identified that despite there being almost no difference between teachers and learners in their general use of social media, learners reported more often using the features of social media for language learning than teachers reported using it for language teaching. To better understand the perceptions of social media that underlie this disparity, I performed a thematic analysis of discussions data generated from two workshops. The analysis surfaced three themes: *social media as distinct language type*; *social media requiring a navigation of appropriateness*; and *social media allowing for the prioritisation of authentic communication flow*. Using the unplatformed

design model, I then translated insights from these three themes, into four design recommendations based on the four material qualities of social media technologies. These recommendations are: prioritise representation of activity that models authentic use of social media; use role to create learner-led and learner-owned spaces on social media; structure dynamic morphologies to create pathways toward authentic use of social media; and plan for permeability in incorporating social media in both traditional and new methods of assessment.

The following chapter brings together and synthesizes the findings from this and the previous chapter into a closing discussion, where I reflect upon the utility of the unplatformed design model within these two case studies, and more broadly. The discussion is framed in respect to existing research presented within the literature review, and makes claims as to the wider implications of the model going forward.

Chapter 7 Discussion and Conclusion

7.1 Introduction

In this thesis, I examined the concept of appropriation of social media technologies for the coordination of participation, which in combination with a critical review of research in HCI and ad-hoc practices, enabled me to identify the importance of, and need for, a more systematic and coherent articulation of appropriation of social media technologies in design. After an initial design study, WhatFutures (chapter 3), where I used WhatsApp to coordinate global participation in a strategic foresight activity with the International Federation of Red Cross and Red Crescent Societies, I described a novel model for the appropriation of social media technologies: unplatformed design (chapter 4). The model conceptualises such technologies as *design material* and invites consideration of ways in which their material qualities can be *configured* and *augmented* within the design of participation. These material qualities have been informed by Paul Dourish's concept of the materiality of information (Dourish, 2017) referring to "*those properties of representations and formats that constrain, enable, limit and shape the ways in which those representations can be created, transmitted, sorted, manipulated and put to use*", as well a reflection upon the design elements of WhatFutures and two other case studies (Celina et al., 2016; MacLeod et al., 2017). Through a series of empirical design studies, I have investigated the validity and utility of the model for unplatformed design.

Chapters 3, 5 and 6 of this thesis have documented the process of designing, developing and deploying systems for coordinated participation through the appropriation of social media technologies, in contexts ranging from strategic foresight, to peer support for extreme weight loss in diabetes management, to pedagogical use in learning and teaching modern languages. These deployments and design processes have provided a number of insights into the application of the unplatformed design model. In this discussion chapter I reflect on these insights, discuss the potential implications of the model, limitations, and propose possible avenues for future research. I then revisit my research questions and the degree to which I have answered them within this thesis, along with a statement of contributions.

7.2 Reflections on the Unplatformed Design Model in Use

The unplatformed design model has been applied within this thesis at different points in a design process, and with different levels of stakeholder involvement. It has been used early, to inform the design of user research workshop activities in chapters 5 and 6, and it has been used to translate user research into the final design of an unplatformed system as part of the Barbados Diabetes Reversal Study 2 (BDRS2) in chapter 5. It has also been used to generate design recommendations for practitioner audience (language education in chapter 6). Additionally, WhatFutures in chapter 3 details the use of an embryonic version of the model as a way of responding to a very specific engagement problem set by a collaborating organisation. These varied applications of the model within design processes, provides an opportunity to reflect on the various elements of the model and the role they played in each. In particular they have allowed me to systematically think through these elements, their relationships to each other, and the specific design considerations that they highlight as part of these design processes.

Broadly speaking, I have used the *material qualities* of the unplatformed design model (morphology, role, representation of activity and permeability) to draw attention to the manipulatable and constructive properties of social media technologies within design processes. But it is only through considering the *operations* that can be applied to them (configuration, hard augmentation and soft augmentation) that the design space for these material qualities are identified. It is the combination of these elements of the unplatformed design model that give it its utility within a design process, through highlighting the design space, and framing it in terms of coordinated participation.

To illustrate and summarise this, table 11 contains examples of the types of design considerations that are generated through applications of the model, as well as short summary descriptions of the material qualities of the model and of the operations that can be applied to them. It should be noted that there is an additional temporal factor to these operations, in that they occur in time, at different points within a process. Although based on

Material quality of social media \ Operation on material quality	Configuration - arrangement and combination of features of a social media technology	Hard Augmentation - introduction and combination of additional technologies	Soft augmentation - establishment of agreed practices and social behaviours
Morphology - the overall form and structure of connections and relationships between users	Group size; group membership; number of groups; friend, follow, subscribe relationships between users etc.	Extensions to groups on other technologies (e.g. slack channel, email list) etc.	Hierarchies between groups; group goals (e.g. work, social, general); pre-existing (external) relationships between users etc.
Role - the communication, understanding and designation of a user's identity and related actions, duties and expectations	Administrative rights; authorial rights; access rights etc.	Administrative rights (etc.) on external technologies; access to external technologies etc.	Establishing duties, tasks, responsibilities; training; communication of expectations; modelling of ideal behaviours etc.
Representation of Activity - how the activity of users is presented, curated and navigated,	Choice of media type (text, video, image, audio); Public/private; Curation of activity (e.g. pinning important posts) etc.	Externalisation of activity (e.g. posting on external website); Use of external resources; comments and activity on external technologies etc.	Practices around when and where activity should be posted/made visible; establishing of media sharing practices etc.
Permeability - the ways by which a system and users can receive, output and exchange information with other systems and users	Uploading/downloading data and information using inbuilt features; user input/output methods; built in communication features etc.	External technologies communicating through API; mini-applications (e.g. chatbots or mini-programs); data-wrangling software etc.	Establishment of manual import/export practices; scheduling of data collection/posting etc.

Table 11. Examples of design considerations generated through the unplatformed design model

reflections of the model in practice, the examples of design considerations within the table are clearly generalizable across other domains and contexts, and reflect the broad set of concerns within the design of coordinated participation.

Correspondingly, the following discussion section returns to the *material qualities* of social media technologies at the heart of the model proposed in chapter 4, and evaluates them in light of insights generated through their configuration and augmentation in the studies within this thesis. In each case I discuss the wider implications in terms of coordinated participation, then focus on specific examples drawn from the design processes detailed in previous chapters. After this, I enter into a wider discussion of the interrelatedness of the material qualities.

7.2.1 Reflection - Material Qualities

Morphology

Perhaps the most conceptually simple of the material qualities, *morphology* refers to the overall form and structure of connections and relationships between users. As the nature of these connections differ, so do their implications on the interactions that take place on, and with, that system. This can be seen quite clearly when considering ‘groups’ of users, where size, membership criteria, and connectedness of groups characterize the qualities and dynamics of interactions between participants. Manipulating morphology through group size and membership has clear implications on factors such as mutual understanding, group cohesion, and capacity for decision making (Kamel & Davison, 1998; Lowry et al., 2006). This has been evidenced throughout this thesis, in chapter 3 I designed WhatFutures to consist of multiple separate groups of 4-8 members to support creative collaboration and teamworking; in chapter 5 I created larger groups within Barbados Diabetes Reversal Study 2 (BDRS2) to create a sense of community within the groups and to support low effort participation; and in chapter 6 I explored how different groups sizes within language learning can communicate completely different expectations of participation and support different types of learning

(accuracy vs. fluency). Upon reflection, the manipulation of morphology in these terms is by far the most direct way to affect the quality of interactions between individuals.

Connections between groups and individuals, realized through overlapping membership, may be a channel through which information and knowledge diffusion can occur (and can be influenced). This can be used in the establishment of hierarchies through morphologies, where one or more sets of individuals (e.g. administrator future guides in WhatFutures and health advocatess in BDRS2) had privileged access to more groups than regular participants, and were tasked with the dissemination of information. From a mechanical point of view, establishing hierarchies in this way made it easier for me to distribute information within WhatFutures and BDRS2, as all I had to do was post it to the administrators, who would then disseminate it through their groups. Morphology was also particularly useful in translating pre-existing hierarchies and power relationships into final designs. This can be seen in BDRS2's health advocate WhatsApp groups, a group for participants on the study with elevated responsibilities that mirrored the pre-existing connections those participants already had within BDRS2. Morphology then, as a constituent element of the unplatformed design model, is a useful tool for establishing new, or reinforcing existing hierarchies and power relationships within a community.

In respect to its temporal dimension, morphology can be altered (e.g. through expansion or contraction at various stages) to further affect and change the qualities described above. For example, a large group may make sense at one stage of a coordinated participation (for introductions, getting to know each other, announcements etc.) but then be split up into smaller groups which are more conducive for collaborative work and decision making. Similarly, groups can be evolved and changed over time to take into account different needs of participants at different stages (e.g. for ensuring privacy such as in the establishment of 'breakout' groups within BDRS2).

Decisions around morphology in this thesis were also heavily informed by understandings of practice. By this I mean the intended work activities of a coordinated participation. Referring to creative collaboration in WhatFutures, group-based peer support in BDRS2 and activity context in language learning. For example, an existing understanding of small team-based group work within creative collaboration actively influenced the morphological decisions to make team groups in WhatFutures consist of around 4 members. Similarly, research on group peer support identified the need for a larger shared forum for discussion, leading to the decision for BDRS2 as having a large central group. Within language learning, knowledge of existing practice in teaching and learning, (e.g. that size and number of groups is directly related to comprehension) led to the recommendation for a dynamic morphology that scales with a learner's confidence. In these cases, we can see that morphology is a useful tool for establishing new, or reinforcing existing practice within a coordinated participation.

Role

The material quality of role concerns the communication, understanding and designation of a user's identity and understanding of the actions, duties and expectations related to that identity. Role is a powerful mechanism for scoping anticipated contributions of both participants and groups, and in making expectations concerning division of labour explicit (Cohen & Lotan, 2014; David W. Johnson & Johnson, 1999). Role can also be understood through divisions of expertise (e.g. health advocates within BDRS2, teachers within language learning) and divisions of perspective (e.g. different specialisms in WhatFutures). The quality of role is also a determinant of different distributions of power, disparities in information and responsibility. This has been evidenced throughout this thesis, in chapter 3 I used role extensively to foster multiple perspectives on complex issues through player specialisms in WhatFutures (here it overlapped with morphology in the creation of specific conference groups for each specialism); in chapter 5 I translated the existing health advocate role found in BDRS2 into the peer support system and created a new social media role in support specific technical tasks (exporting data and technical support); in chapter 6 I explored the navigation of appropriateness required when there are existing role imbalances (e.g. between teacher

and student) and the potential of roles for simulating learning scenarios (e.g. through roleplay activities etc.). Upon reflection, the manipulation of role in these terms is a highly effective way for framing individual and group participation, and for establishing the responsibilities and division of labour necessary for collaborative work.

In respect to its temporal dimension, role is closely linked to processes and procedures of a coordinated participation. As the requirements of a project differ over time, (e.g. data collection stages, data generation stages, setup stages), role can be configured and augmented along with them. This could include assigning or removing administrative privileges at pertinent points in a process, and the assigning of different tasks corresponding to different stages of participation.

Looking at more detail at the design studies in this thesis, decisions around the configuration of role were most typically based around who was attributed administrative rights within a social media technology. This reflected the intended hierarchies within each study, so, future guides and health advocates were assigned administrative privileges within their WhatsApp groups whereas higher 'order' groups administrative privileges were owned by the research team. Upon reflection, decisions around configuration were relatively straightforward, and the model assisted primarily in bringing these into focus. Conversely, within the context of language learning I advocated for a flattening of hierarchies and for administrative roles to be filled by learners as opposed to teachers, in line with peer led learning theories (Guàrdia et al., 2013) and in support of authenticity of communication. Here the material quality of role, was useful in reflecting upon the implications of translating existing power dynamics (tutor vs learner) into a social media learning space.

Decisions around the augmentation of role - those quality of roles that lie beyond administrative and authorial permissions - were a bit more complicated. Reflecting on the design processes illustrates that again decisions around the augmentation of role are influenced by both community, and practice. In terms of community, BDRS2 showed how existing community roles within the medical intervention (health advocates and health leads)

were translated into the peer support system. Furthermore, community insights as to those who had more experience with social media informed the creation of the social media leader role. In terms of practice, WhatFutures borrowed from game design to inform the creation of roles. Here an intended collaborative style was engineered from modelling existing practice in multiplayer team games. Likewise, roleplay was suggested within language learning based on existing teaching practices.

As the potential design space for augmenting role is so large, it is clear that applying the concept of role successfully within a design process is dependent on an underlying knowledge of both the intended community and intended practice, whether reinforcing existing, or engendering new forms of both. Furthermore, 'context collapse', that is the challenges of presenting a single identity to multiple imagined audiences on social media (Baym & Boyd, 2012; Marwick & Boyd, 2011), bring additional complexities as external power dynamics interact with internal and design power hierarchies. Because of this, I suggest that the quality of role requires additional support and guidance for it to be applied practically. In particular, questions are raised not just on the augmentation of role, but on the ways in which that role can be communicated, supported and enforced. For example, how does a participant come to understand their role? What part do other participants play in communicating and enforcing roles? How can roles be evaluated? Although the material quality of role is undoubtedly useful both productively and conceptually within a design process, it may be that the configuration and augmentation of role, and the communication and regulation of role, require more distinction within the unplatformed design model.

Representation of Activity

The material quality of representation of activity refers to the manner and methods by which the activity of participants is presented, curated and navigated. By activity, I am referring to the products of participants' interactions with each other and the social media technology, such as posts made on Facebook, media uploaded to WhatsApp, tweets, direct messages etc. Decisions around how, when and whether activity is made visible drives behavior, knowledge

exchange and a sense of collective action or competition. The manner in which activity is represented also greatly affects what we can do with it (Dourish, 2017). Furthermore, features that allow the navigation and surfacing of historical activity (e.g. through search functions, tags, or otherwise) also have an effect on the potential complexity of collaborative tasks. They may support or inhibit the ability of users to manage large amounts of information and multiple sources (Johansen, 1988). This has been evidenced throughout this thesis, for example in chapter 3 I designed an external leaderboard of participant activity to create a wider awareness of other's activity and to foster a spirit of friendly competition; in chapter 5 I designed a handbook for health advocates in BDRS2 to act as a resource for them, and to heavily encourage the creation of multimedia content within the peer support system to motivate engagement; and in chapter 6 I explored the idea that a representation of activity that is authentic to genuine social media use is important for language learning on social media. Upon reflection, the manipulation of representation of activity is a mechanism that most greatly affects participant engagement with, and ability to comprehend and contribute to, tasks and collaborative activities.

In respect to the temporal dimension of representation of activity, decisions as to when to make activity visible are very important. Scheduling of information is used to communicate the various stages of a coordinated participation, to instruct and to advise when relevant, and to communicate overall goals. Quick and timely representation of participant's activity is crucial for creating a sense of community, and therefore for forging connections and collaboration between people.

Looking specifically at the design processes in this thesis, representation of activity also brought my attention to questions around what activity to make public and what to make private. In the case of BDRS2 the boundaries of what could be made public were clear from the conditions of the study and the potentially sensitive nature of communication, this required a relatively simple configuration of WhatsApp. In WhatFutures and language learning and teaching, decisions around what information can and should be made visible were more complex due to different relationships between participants (e.g. future guides

and player roles in WhatFutures, or different levels of learners in language education). In both these cases, thinking in terms of how activity is represented on social media technologies allowed for careful configuration and augmentation to achieve an ideal representation. This ideal, similarly to the qualities discussed above, was based on an understanding of existing practices (peer support, multiplayer games, peer-led learning).

Reflecting on the design processes has allowed me to more clearly see how different modes of communication on social media technologies (e.g. text, audio, video, image) and the different ways activity is organised and presented (e.g. one chronology/timeline, threaded replies, categories and tags) act both as possibilities and constraints within design processes. In terms of possibilities, thinking through the design space for representation of activity allowed me to identify levers for improving the visibility and discoverability of important information (e.g. presenting WhatFuture's challenges in image format); promoting engagement and contribution (e.g. video and picture challenges in BDRS2 groups); and facilitating wider participant choice (e.g. learners communicating in whatever mode they are most comfortable in a second language). In these examples, representation of activity made it easier for me to identify features of social media technologies that could be productively and creatively employed within a final system.

However, as mentioned above, the manner in which activity is organised and presented by social media technologies has significant implications on the types of work it can realistically sustain. For example, chronologically-presented text-based messaging in WhatsApp or Facebook messenger are naturally more suited to 'in the moment' discussions that do not require searching and/or referencing of previous activity. They are far less suited to complex collaborative tasks, such as writing code, or long form essay writing, where fine detail and iterative editing of text are the norm. Returning to the analogy of the carpenter making the table that I introduced in chapter 4, it is clear that representation of activity refers to the 'grain' of the social media technology. In the same way that 'going against the grain' makes wood more likely to splinter and break in carpentry, going against the grain in appropriating social media technologies (e.g. collaboratively writing a novel on Twitter) makes it much

harder to perform that work. In this way we can see that the material quality of representation of activity is very valuable within a design process, as it allows for clearer identification of the grain of social media technologies, and thereby helps shape the design of participation alongside that grain. For example, the recommendation to model 'authentic' communication within language education. Consequently, it also helps identify where activity may need to be augmented by the introduction of external tools or processes.

As it is proposed in the unplatformed design model, representation of activity refers to both the public/private visibility of activity and also to qualities of representation such as organisation and presentation. From reflecting on its application in design processes, these two facets are conceptually distinct, and require different design consideration. Therefore, it is possible that the model will be improved by clarifying this material quality to consider these two areas more closely.

Permeability

The material quality of permeability refers to the ways by which a social media technology can receive, output and exchange information with users and other technologies. The immediate implications of this in terms of scale and capacity are relatively obvious. Manually entering or exporting information may make sense in smaller studies but quickly becomes impractical at scale, whereas automated distribution and collection of information and data works better. However, the method of input also affects the quality of that communication. Automated or bulk communication has a different character to human inputted communication, and this will in turn affect how it is perceived and engaged with by participants (Hill et al., 2015). Likewise, the formats in which data can be collected change what can be done with it and so may entail different approaches to analysis and the introduction of external tools and software. Related to this, the easier it is for information to be transferred between systems the easier it is for hard augmentation (across the material qualities) to take place. These different factors have all be explored within this thesis, for example in chapter 3 and chapter 5 I used external tools (Google Drive) to facilitate exporting

data from WhatsApp due to the relative of interaction between the two applications; in chapter 5 I ensured participants used the input methods that they already understood; and in chapter 6 I explored the implications of permeability on assessment and progression within language learning on social media. Upon reflection, although it is possibly the least conceptually exciting of the material qualities, the manipulation of permeability in these terms nevertheless is a highly important for determining how easy it is for participants to take part, and how easy it is for designers, researchers and practitioners to gather data and evidence. In respect to the temporal dimension permeability, much like role, decisions as to when information should be input or output are intrinsic to any process of coordinated participation.

Looking in detail at the studies in this paper, each system was designed so that participants used the default and unaugmented input options for social media technologies, e.g. using WhatsApp application on their phone, as they would every day. The reasons for this were to lower barriers of engagement (WhatFutures), 'blend into everyday life' (BDRS2) and to match authentic communication (language education). As one of the primary motivations for taking an unplatformed design approach is to 'go where people are already talking', to use input methods that add an additional burden onto participants seems counter to the goals of appropriation in the first place.

Thinking in terms of permeability was most useful in the design processes, where it was used to consider how the research team and participant administrators could input and output information. In this context issues around scalability and automation were more apparent. Thinking through permeability was crucial in the design of processes for outputting data in WhatFutures and BDRS2, and will be in any design for assessment within language education. In this way it acts successfully as a bridging concept between an understanding of the capabilities and features of a social media technology, and the requirements of a coordinated participation in terms of outputted data. Additionally, more so than the other material qualities, thinking through permeability helped clarify the need for hard augmentation in terms of inputting and outputting of data with participant administrators and the research

team. This consisted in the use of external tools for data storage in WhatFutures and BDRS2, as well as tools for measuring and recording completion of responsibilities.

7.2.2 Reflection – Material Qualities in Symphony

In the previous section I have discussed each of the material qualities of the unplatformed design model individually, and have referred to how each act as levers for shaping various aspects of coordinated participation. However, in reality these material qualities do not exist independently of each other. Instead they work together and are mutually interlinked. To return to the analogy from chapter 4, of the carpenter constructing a table. When working with the wood he has chosen for the task, the carpenter does not consider each of the wood's qualities (e.g. grain, pliability, density) in isolation, instead he considers how all of them work together in tandem in support of the overall table. This is equally true with the material qualities of social media technologies when designing coordinated participation.

To illustrate this simply, we can see how changes to one material quality may have effects on the others. For example, the choice of a morphology that favours a large group size with many members may, due to an increased amount of user activity, require a different consideration of representation of activity than a morphology which favours small groups. We can see this from chapter 6, in the discussion of large social media groups within language learning. Participants reported feeling overwhelmed by the sheer amount of activity they experienced within these language learning groups, many of which had 100+ members. This has a natural implication on representation of activity in terms of how important information is made visible (e.g. pinning or marking important information, using a sperate focus point website, notifications), and on how activity geared towards collaboration and communication occurs (e.g. designing simple activities with simple contributions may be more suitable to large groups than complex ones). It may also entail changes to role (e.g. creation of community leader roles, or roles that are tasked with summarising large amounts of content) and changes to permeability (e.g. requiring different approaches to data export and analysis). From this

we can see that it does not make sense to consider each material quality in isolation, as all are interlinked and mutually dependent.

In terms of how this knowledge is applied within the design processes of participatory projects, from my own experience it involves working within the constraints of the community and domain contexts in which you are designing. For example, WhatFutures involved the creation of player specialisms to facilitate multiple perspectives on complex global issues. This design decision as to *role* was informed by game design and group learning literature. However, sustaining these roles also entailed specific configurations of morphology (the creation of specialism specific WhatsApp ‘conference’ groups) and representation of activity (the creation and distribution of specialism specific content and activities). Similarly, in BDRS2 the strong church community, along with best practice from literature about designing online peer support, all highlighted the importance of creating a large and open central group for peer support system. This acted as a morphological constraint of sorts around which consideration of other material qualities was framed.

The wider point here is that any configuration or augmentation of the material qualities of social media technology must necessarily balance these interrelated qualities, ultimately in service of the overall goals of the coordinated participation.

7.2.3 Reflection – Communities of Practice

In chapter 2, I discussed Etienne Wenger’s concept of communities of practice (Wenger, 1998). A community of practice is purported to compose of three things: *domain*, *community*, and *practice*. Domain is defined as the central shared domain of interest for the community. Community refers to the group of individuals who, in pursuing their interest in their domain engage in activities and discussions, help each other, build relationships and care about their standing with each other. Lastly, practice refers to a shared repertoire of resources: experiences, stories, tools, ways of addressing recurring problems. According to Wenger *‘It is the combination of these three elements that constitutes a community of practice. And it is by developing these three elements in parallel that one cultivates such a community.’* Each design

study in this thesis has also involved the development of these elements. Put bluntly, WhatFutures, BDRS2 and the language education study, are all attempts to build successful online communities, oriented towards a shared goal, and with a shared set of tools and resources. Returning to the concept of communities of practice now, allows me to summarise these unplatformed design processes as attempts to cultivate nascent communities of practice. Doing so allows us to see more clearly the role the unplatformed design model plays within the overall goal of these processes.

In each of the unplatformed design studies in this thesis, the overall *domain* of the study remained a constant guiding principle throughout. These domains (collaborative future foresight, peer support for weight loss, and language education) established the parameters of success in each of the studies, and consequently framed requirements as to the generation of data, recruitment of participants and design of activities. Within the studies, domain was not an object of design, that is to say, domain was not something realised through the design process. Instead it acted as a foundational research context and a set of constraints. Contrary to this, Wenger's concepts of *community* and *practice* can be clearly seen as being actualised through the unplatformed design processes.

From the discussion of material qualities in the previous section, it is clear that the model was used to make design decisions informed by insights into community, such as norms, values, hierarchies and so on. This is certainly the case with existing communities (e.g. participants in BDRS2, Red Cross volunteers in WhatFutures, and language learners). However, these insights were ultimately employed in decisions of how to actualise a new online community, through configuration and augmentation. For example, decisions were made around what positive elements of community can be translated into the new one (e.g. willingness to help in BDRS2, volunteer code of conduct in WhatFutures, existing peer relationships in language education). But also, how to foster new elements in that community that did not exist before (e.g. broadening concepts of case in BDRS2 through creation of online peer support handbook). The same can also be said for notions of practice, where insights into existing practice (e.g. current language pedagogies, creative workshops in WhatFutures, physical peer-support

groups in BDRS2) directly informed the design of new online practices based-on social media technologies. I therefore claim that the successful application of the unplatformed design model depends on a clear understanding of qualities of the existing communities and of existing practice, but also crucially of the intended qualities of the nascent community and intended practice. In this way the unplatformed design model primarily acts as a *trajectory* between the two, a trajectory between real world communities and practices towards the creation of a new, social media-based, communities *of* practice.

This very conceptual and theoretical reflection on the unplatformed design model as it is used within design processes, helps to frame the purpose and utility of the model more clearly, within the wider context of the design of participation. In the next section, I reflect on the model in terms of how it could be extended to incorporate more practical guidance as to the trajectory between communities, domains and design in this context.

7.2.4 Reflection – Extending the Model

As discussed in the previous section, successful application of the unplatformed design model is underpinned by an understanding of the community and domain context of a coordinated participation. However, the reality of translating this understanding into design decisions rests heavily on a designer's experience and own sense of practice. It is undoubtedly the case that any designer brings their own experiential perspectives to a design process, and that these guide and shape the decisions they make (Ingold, n.d.). For myself, the design decisions made in this thesis were informed by my own background of game design, experience of appropriating existing technologies, and to some extent my own ideas and observations of human behaviour. Additionally, as the creator of the model, I am clearly at an advantage when it comes to interpreting and applying it to a design process.

From this, it seems uncontroversial to say that there exists room for the model to be extended towards making it easier for different designers and non-designers to apply in practice. Although the model was always intended to be more of a set of sensitizing concepts or 'lenses' than a 'turn the crank and out pops a final design' type of framework, it is clear through

reflection that there is a need for more practical guidelines. Largely this would consist in closing the interpretive gap that exists between an understanding of community/domain and decisions of configuration and augmentation of the material qualities of social media technologies.

Guidelines could focus on particular qualities of communities or domains within a coordinated participation, and recommend configurations and augmentation that respond to this. As an example, if within a design process we are aware that participants do not know each other and we wish to build rapport between them in coordinated participation, we might imagine guidelines that suggest specific configurations of morphology, role etc. To continue this example, this could be suggestions such as: keeping group sizes small so people have room to communicate with each other (morphology); creating a specific role for an administrator or participant to act as an 'introducer' for new participants (role); configuring visible and sharable welcome information that encourages and models supportive communication (representation of activity); and outputting examples of welcoming behaviour onto a more visible website or blog (permeability), to name just a few. Conversely, if a community are already familiar with each other we might instead recommend configurations and augmentations that allow for and support that community in expressing their existing shared practice and relationships (e.g. modelling existing roles within that community, modelling existing morphologies and hierarchies, and configuring permeability to interface with existing technological practices).

The extension of the model that I have described above consists of a series of guidelines. Each guideline would take an understanding of community and/or domain and an understanding of the desired behaviours of the coordinated participation, and suggest a corresponding recommendation as to how these understandings could be taken into account within unplatformed design. It is my opinion that this would widen the accessibility of the model and improve its applicability. Creating these guidelines is a significant project, and likely a fruitful direction for future research. One line this research could follow would be to look at other models and frameworks that describe the characteristics of communities and

participation/collaboration, and investigate the ways in which the insights these models provide can be synthesised with the unplatformed design model.

To illustrate this idea further, I will briefly look at the Model of Coordinated Action (MoCA) (Lee & Paine, 2015) within the field of Computer Supported Cooperative Work. MoCA is a broad framework for describing complex collaborative situations and environments including, but not limited to, collaborations that have diverse, high-turnover memberships or emerging practices. It consists of seven dimensions, *synchronicity*, *physical distribution*, *scale*, *number of communities of practice*, *nascence*, *planned permanence* and *turnover*. Each of these dimensions maps to a continuum which describes one particular characteristic of a collaborative activity (see figure 16).

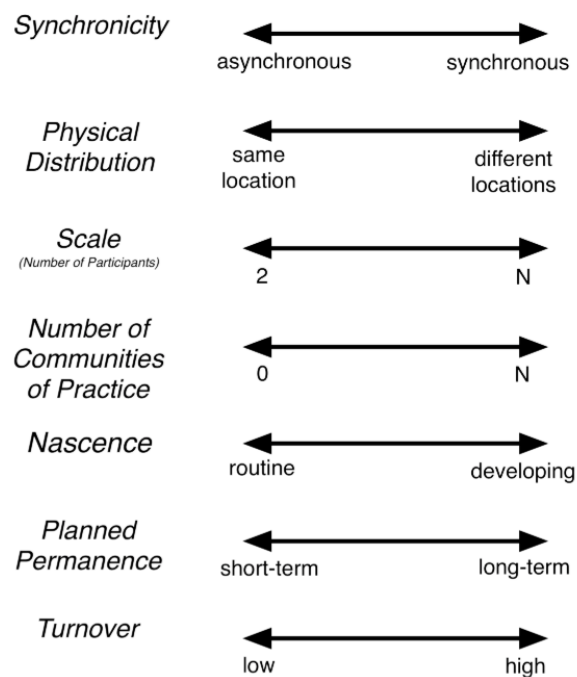


Figure 16. The dimensions of the Model of Coordinated Action. Reproduced from (Lee & Paine, 2015)

One line of enquiry would be to investigate relationships between these dimensions and configurations of the material qualities of social media technologies within a coordinated participation. For example, are there particular types of morphologies that are beneficial to

collaborations with high turnovers of participants? What are the relationships between role and scale of participation? These sorts of questions can help to generate the design guidelines that I describe above. I describe MoCA here not to suggest that it should be incorporated within the unplatformed design model, but rather that it could be used as a systematic way to characterise communities, domains and practices, which can in turn be used to inform the creation of guiding principles for unplatformed design. Furthermore, MoCA focusses primarily on characterising collaborative work activities, and as such may be less suited to describing more socially oriented and socio-psychological aspects of communities (e.g. trust, privacy, self-efficacy, cohesiveness and so on. For this, future research should also look to models in social theory and group behaviour.

7.3 Implications of the Model of Unplatformed Design

Moving on from questions and reflections around the utility of the model within design processes, in this section I will discuss some of the wider implications of unplatformed design as an approach. I will begin with a reflection on what I perceive to be the benefits to adopting an unplatformed design approach to the coordination of participation, and end with a discussion of some of the challenges and wider considerations that I have yet to address within this thesis.

Engagement reach

By coordinating participation upon the communication platforms that are already familiar to and trusted by populations (particularly those who are harder to reach or with lower levels of tech literacy), unplatformed design lowers barriers of digital participation, and improves engagement with those populations. Chapter 3 and 5 in this thesis have shown clear examples of where the use of WhatsApp has meaningfully improved engagement reach. Furthermore, MacLeod et al. (MacLeod et al., 2015) identified this effect when engaging participants with rare diseases on Facebook as part of Asynchronous Remote Communities (discussed in chapter 4). Similarly, Vacca (Vacca, 2017) identified the value of engaging young Latina women through communication platforms that they are already comfortable using as

opposed to trying to get them to use novel technology, whilst Alhadlaq et al. (Alhadlaq et al., 2019) found the same with an e-mentoring scheme for young Saudi women. As we have seen, by building interactions on platforms that people are already using, a number of seemingly trivial but important practical barriers to engagement are removed. For example, it removes the need for participants to download unfamiliar software or use any special hardware, lowering the barrier to engagement for those with lower tech literacy or time constraints.

Usability

Following on from an increase in engagement, unplatformed design also offers potential for an increase in the quality of engagement. Typically, popular social media technologies such as WhatsApp and Instagram have extremely well designed, engaging and accessible user interfaces with a variety of affordances. This, coupled with the fact that participants may already be familiar and confident with using them, means that participants may be able to perform tasks and engage in interactions with a high level of competence without the need for any training. Without the potential distractions provided by navigating unfamiliar interfaces participants are free to engage more directly and expressively with designed interactions. In this way, unplatformed design can blend into everyday life.

Flexibility

As an approach, unplatformed design is not restricted to any specific domain or discipline. It can be equally used to design e-learning environments (Celina et al., 2016), engagement games for strategic change (chapter 3), peer support for health (chapter 5) amongst others. From these examples we can also see the suitability of the approach for engaging with small sets of participants in smaller 'private' engagements, but also its use in large scale, public facing engagements with thousands of participants. Unplatformed design offers a genuinely scalable approach, allowing flexibility in how it is configured to suit different sizes and modes of interaction.

Efficiency

One obvious benefit to unplatformed design is that it can significantly reduce the cost, in both time and resources, in software development. Most significantly, removing the need to design and develop bespoke software or applications enables quicker prototyping and shorter design cycles overall. This is immediately of the benefit to designers but also to stakeholders and collaborative organisations. Similarly, the reduction of resource cost means this approach is more accessible to smaller organisations and groups who may not have the resources required to employ software designers. The potential reduction in technical labour requirements allows groups without technical expertise to design and deploy systems for participation and still benefit from large reach, robust infrastructure and scalability of social media technologies. Unplatformed design can also be seen as a way of reducing the amount of unused and abandoned software that is frequently the result of research and development projects.

Capacity Building

Unplatformed design offers a way for research to quickly respond to real-world needs. This can be seen in the studies within this thesis, as well as those such as Asynchronous Remote Communities (MacLeod et al., 2017) and Online UWC (Celina et al., 2016). Designing coordinated participation on existing social media technologies gives research an opportunity to engage with real world problems, in high fidelity and at scale. In this way, unplatformed design can be leveraged by collaborating organisations to work at scale, particularly in contexts that are resource constrained or where the barriers of participation need to be lowered (e.g. NGOs, developing contexts, distributed populations).

Accessible to non-technical

The introduction to this thesis started with a description of how teenagers appropriated Instagram to act as an events application, all without a single line of code. This is a perfect example of how creative appropriation of existing technologies does not require technical

development skills, but instead requires an understanding of the possibilities offered by the affordances of social media technologies. By extension, unplatformed design offers a systematic method (as opposed to ad hoc practices) of this genre of system design, and as such constitutes an approach that puts the creation of scalable and robust digital engagements into the hands of the non-technical.

Implications on software design

A spread in the popularity of unplatformed design may also have implications on the design of social media technologies themselves. As unanticipated usage patterns and shortfalls of technologies are identified, social media technologies are modified to meet them. We can see this with Facebook's creation of specific health groups (Lovett, 2019) with increased privacy controls and WhatsApp Business App (WhatsApp, 2019) for increased options for tailoring and automation. Similar to how research around designing for appropriation (Dourish, 2003; Dix, 2007; Tchounikine, 2017) leads to a practical understanding of the elements of software design that lead to greater user customization, material understandings of social media technology may lead to them being designed with these material qualities in mind. This may entail changes to application infrastructure to better facilitate combination with external tools, or the creation of new flexible ways for users to communicate and coordinate social processes within technologies.

Zhou and DiSalvo argue that appropriation of social media technologies by users is one of the primary factors that leads platforms to evolve and develop into infrastructure (Zhou & DiSalvo, 2020). In a three-year study of the Chinese social media app WeChat, they argue that WeChat has moved from being a platform that is primarily used for instant messaging between users to a fundamental digital infrastructure that is intrinsic to life in China:

"...users still operate within WeChat's technical constraints, but they push the practices envisioned by WeChat through appropriating its functions for their local contexts and needs. Therefore, the platform designed for global use is localized by individual users in their own

practices, reaching a deep embeddedness in each of these users' lives. For those who appropriate WeChat, WeChat is an infrastructure.” (p8)

Zhou and Disalvo argue that it is this deep embeddedness through appropriation (amongst other factors including cost, widespread use and customizability) that slowly and incrementally transformed WeChat from platform to a necessary part of Chinese life. However, they warn that this transformation does come with its own ethical pitfalls,. For example, it is impossible to have such a widespread and all-pervading digital infrastructure as WeChat without a correspondingly extreme market domination and monopolization. This they argue may in turn hamper the freedom of its users in the long term who are ‘forced’ to use WeChat, and therefore to surrender their data to private companies. I revisit these ethical considerations in the next section.

7.4 Challenges and Considerations

In the previous section I outlined some of the wider implications of taking an unplatformed design approach in relation to the potential opportunities and benefits that it provides. In this section I will now discuss some of the wider challenges, both technical and ethical, that face the unplatformed design approach that future work will need to consider and respond to.

7.4.1 Building on ‘shifting sands’ – Lack of control over social media technologies

The core element of unplatformed design is the creative appropriation of social media technologies for coordinating participation. It is through the features and functions of social media technologies that any unplatformed participation takes place, whether this is using app provided input and output methods (e.g. posting a tweet on using the twitter client) or using APIs (e.g. automating a tweet from a bot). However, in reality the operators of these large social media technologies are completely free to modify or change any element of their platform as and when they see fit. This has obvious ramifications for any unplatformed participation that is designed on those platforms, and could be seen as building digital infrastructure on ‘shifting sands’. There is a risk that a key feature of a social media technology could be modified or removed midway through a designed participation. If for example the

ability to export data from WhatsApp were removed during WhatFutures, this would have had serious implications on the engagement both in terms of being able to access participant's multimedia challenge responses, but also for my ability to gather and analyse data. Even subtle changes in interface may also affect how a feature is interacted with, for example a designer may want to use a 'like' feature as a voting or tagging mechanism, if the like button is changed (e.g. from a star icon to a heart icon), this may in turn change how it is perceived and therefore how appropriate it would be for that intended use. Similarly, although large-scale massively adopted social media technologies are generally extremely robust, full outages and partial loss of service do still occur. These would obviously affect any unplatformed system that used those services, and the lack of control over when services might resume compounds this issue.

What might be done about this? Firstly, it is worth noting that some features may be more at risk of modification than others, for example features in open beta or older 'legacy' implementations on APIs are more likely to be changed or removed than those core to a social media technology. It might be that designers could reasonably identify which features that they intended to appropriate are most at risk. Moving from this, designers might create back up plans for those key features in case of modification. Another approach, although it is unclear how successful it might be, would be to engage in dialogue with the operators of these large-scale platforms in order to establish the stability of key features. Regardless of how they are mitigated, it is clear that the risks associated with lack of control over social media technologies is something that unplatformed design must consider moving forward.

7.4.2 The unforeseen consequences of algorithmic decision making

Many social media technologies have incorporated aspects of machine learning into their integral functions. For example, the algorithms which determine the discoverability and visibility of items on a news feed on Twitter and Facebook, or that identify and punish perceived hacking or automation threats. These algorithms are often inscrutable and unknowable (even to their creators sometimes), and so as designers it is hard to know exactly

what the real implications are for the interactions we facilitate. For example, does sharing personal information in a private group influence the type of content delivered to users or to people in their network? Although we may have control over the drops on the surface, we have no control over the ripples within the labyrinthine machine mind.

An example of this can be seen in the global WhatFutures game that took place after the pilot study detailed in chapter 3. In this version of the game, some Future Guides were required to manually input and create upwards of 20 WhatsApp group teams. This resulted in 3 of the future guides being banned from WhatsApp. At the time, I had no idea why this had happened, or what had caused it. After communicating with WhatsApp support I was told that the future guides' behaviour had been automatically identified as 'spam bot' attacks and that they had been banned. These bans were quickly revoked once I had communicated to WhatsApp support the issue, however this starkly demonstrated the risks associated with performing 'unusual' behaviours on social media technologies and how these might be classified by algorithmic decision making. In this instance, this would have seriously jeopardised the ability of around 60 teams (approx. 360 participants) to participate in WhatFutures. More importantly, if the bans were not revoked, this would have had real world consequences for those 3 future guides, all of whom were using their personal devices and WhatsApp accounts to take part, and who used the same to communicate with families and friends. Without a clearer understanding of where these lines are drawn by algorithms, unplatformed design needs to be mindful of the unforeseen consequences of coordinating participation on social media technologies.

7.4.3 Who is accountable?

As we design systems of participation on appropriated platforms, and as the infrastructures and augmentations we build to support them become more complex, questions arise about accountability. What are the implications for accountability when designing a service that is delivered over a commercial platform? For example, if something breaks down, or if people are unable to participate for whatever reason, what are the responsibilities between the

social media technology operator, the organisation or researchers running the unplatformed system, and the participant? If, as discussed above, a social media technology experiences a partial outage so that some participants cannot participate in a council's unplatformed engagement opportunity, is this the fault of the social media technology, or on the council? Unplatformed design potentially muddies the waters of accountability in both legal and ethical terms.

7.4.4 Should we be using social media technologies at all?

Up until this point, this thesis has not directly engaged with some of the wider ethical challenges associated with the appropriation of social media technologies for coordinating participation. At the time of writing, there is increased public scrutiny of large social media corporations due to a number of high-profile examples of unethical data practices¹³, the establishment (and vast profitability) of wide spread surveillance without explicit consent (Zuboff, 2019), the use of algorithms that reinforce racist stereotypes (Noble, 2018), complete lack of ethical diversity within corporate structures¹⁴ to name just a few. Facebook, which owns the social media app used most in this thesis, WhatsApp, has undergone particular criticism due to its role in undermining democracy (Vaidhyanathan, 2018; Baldwin, 2018), based largely on the power of its hyper-targeted political messaging and widespread misinformation (Farkas & Schou, 2019), enabled in turn through a vast reservoir of user data. The hard question that unplatformed design must face then, is should we be appropriating social media technologies at all?

¹³ <https://www.theguardian.com/news/series/cambridge-analytica-files>

¹⁴ <https://www.theguardian.com/technology/2018/nov/27/facebook-race-black-employees-discrimination-accusation>

If unplatformed design seeks to move digital engagement and participation from bespoke researcher-developed applications towards social media technologies, then is unplatformed design only further cementing the monopolies of these huge tech corporations? Furthermore, as unplatformed design seeks to diversify the uses (and therefore usefulness) of social media technologies, are we actually adding value to these ethically dubious digital conglomerates? Similarly, by eschewing typical usage patterns and instead asking participants to engage with a variety of civic, health, and education contexts, are we also asking them to handover a much broader set of personal data to social media companies than they ordinarily would? These are significant ethical questions that must be considered by anyone engaging in unplatformed design. In essence though, these questions are underpinned by two distinct premises: 1) unplatformed design expands the reach of social media technologies; and 2) social media technologies are intrinsically unethical. I will discuss these in turn.

In respect to unplatformed design expanding the reach of social media technologies, I would argue that the overriding principle of unplatformed design for engagement and participation, is to go where people already are. Unplatformed design is at its strongest when it reduces barriers to participation and improves engagement reach by engaging through appropriating the tools already adopted into the everyday lives of people. So, from this, I would argue that unplatformed design does not push people towards social media technologies, but it actually follows them there instead. Of course, the model itself is concerned with the material qualities of social media technologies and the operations that can be performed on them, so this is a question more of the application context of the model rather than something intrinsic to the model itself. For example, the unplatformed design model could easily be applied to social media that participants were not using (in this way, this would be encouraging the use of such a platform), however such an application would undermine the engagement benefit of the approach. In terms of barriers to engagement, there is not much difference between asking participants to use unfamiliar social media technologies, and using unfamiliar bespoke applications (though development costs and robustness are obviously still a factor).

One related challenge that is less clear, is around the fact that unplatformed design generally asks participants to engage with a variety of civic, health, and education topics on social media technologies, and therefore asks them to handover a much broader set of personal data to social media companies than they ordinarily would. The ethical implications of this vary from context to context, and likely from participant to participant. I would suggest that in contexts where this is perceived as higher risk (e.g. where highly sensitive data is generated, or where participants are uncomfortable with potentially sharing such data with social media technologies) more care needs to be taken. This should be both in choice of social media technology, and in being clear upfront with participants (to the best of your abilities) as to the implications of participation in this respect. For this, the social media technologies' own terms and conditions can be examined and re-presented to participants in a way that makes it as clear as possible what will happen with data. However, in some cases the topic and nature of participation being extremely sensitive (e.g. criminal behaviour), may mean that unplatformed design is not a suitable design approach.

In respect to social media technologies as being intrinsically unethical, there is certainly an increasing weight of opinion towards this. We are living through the most profound transformation in our information environment since Johannes Gutenberg's invention of printing in 1439 and it is impossible to get a sense of where it is all heading (Zuboff, 2019). Undoubtedly, the ethical breaches detailed at the start of this section paint these social media technologies in a poor light. But as with all technological revolutions, it is how (and who by) the technology is applied that ultimately shape the moral landscape. As discussed in chapter 2, Tucker et al. identify that social media platforms '*are neither inherently democratic nor nondemocratic, but represent a tool political actors can use for a variety of goals*' (Tucker et al., 2017). As such I would argue that by appropriating these technologies and by eschewing their typical usage patterns in favour of civic discourse and participation, unplatformed design is actually democratising 'who' controls these technologies, and widening 'how' they are applied to encompass social, civic, health and education contexts. If applied in the spirit intended at the start of this thesis, of engaging with people directly where they are and with

issues that matter to them, then unplatformed design has the potential to positively influence the role of social media technologies in civic life. And as designers of digital systems of engagement and participation we have responsibility to be ethical in how they are designed. Taking this critical and ethical stance to the appropriation of social media technologies through unplatformed design can potentially start to establish a new more ethical relationship between social media technologies and society. However, as Zhou and DiSalvo highlight in their study of WeChat in China, it may be naive to think interaction designers can disrupt corporate goals, particularly in respect to the infrastructuralisation of social media technologies where there are clear financial advantages to owning an infrastructure, than merely a platform (Zhou & DiSalvo, 2020).

In summary, it is clear that the unplatformed design approach will have to reconcile its relationship with the more unethical sides of social media technologies going forward. However far from being unsurmountable challenges, unplatformed design actually offers an approach that attempts to go where people are already talking, and reframe that conversation in a more civic minded, more democratic and ultimately more ethical way. Through redesigning how social media technology can be used in society, unplatformed design offers a way of critically engaging with the relationship between social media and civic life, but one where we must advance carefully.

7.5 Methodological Reflections

Before I revisit the research questions and contribution statements of this thesis, I would like to first consider some brief methodological reflections. Firstly, as stated in chapter 1, I describe my research approach as design-led. This has certainly held true throughout each study, where upon reflection I have remained rooted in the specific contexts, complexities and constraints of working to address genuine problems experienced by communities and organisations through design. Therefore, the design-led approach I take in this thesis can be broadly categorized as responding to '*constructive problems*' in HCI (Oulasvirta & Hornbæk, 2016).

A typical example of this problem can be found in chapter 3 in the design of WhatFutures in response to the challenge of engaging large numbers of distributed volunteers in a participatory foresight activity. It is only through my engagement within the process of design, and in the subsequent reflection on the decisions I made, that I moved towards the conceptual contribution of the model of unplatformed design. In later chapters I sought to reconcile this conceptual enquiry with my own design-led practice, and whilst from a practical standpoint this was broadly successful, it is clear that there still exists a lot of 'me' between the two. Put another way, the relationship between the conceptual model I propose and the applications of it within this thesis, is strongly indebted to my own personal design practice. Now I am by no means arguing for a design model that can be completely divorced from the experiences of the designer it is employed by (surely an impossibility). I am however aware of the implications of my design-led approach on the replicability and universality of the unplatformed design model, particularly in its application to real world problems. As stated in above, I hope to address this in future work.

Secondly, I would like to reflect on the novel card-sorting/graphing workshop activity that I employed in both the design workshops of the BDRS2 peer support system (chapter 5) and in the language learning social media system (chapter 6). Although neither card-sorting activities or sentiment graphing (e.g. through Likert scale) are novel in and of themselves, I believe the combination and subsequent application of them within the design processes in this thesis to constitute a minor methodological contribution. I found, them very useful as a way of discussing participant perceptions of various configuration options of social media technologies in peer support (chapter 5), and towards specific affordances of social media technologies in relation to language learning. In both instances the graphing activity was quickly understood by participants, and generated rich, insightful discussion to inform the design of subsequent systems.

Whilst in these examples the cards sorted within the activity were generated through an application of the unplatformed design model, the method does not depend on this. I would like to further develop this interaction design method to suit other types of enquiry.

Furthermore, whilst I primarily used the activity as a prop to generate discussion data (rather than numeric scoring), I would be interested in investigating and potentially developing its sophistication as a quantitative instrument. With a careful and thorough development, the method could be used in interaction design workshops to generate both qualitative and quantitative data, which may then be cross referenced and compared during analysis to generate further insights.

Lastly, I would like to remark on the emphasis on qualitative research methods within my research. It is no surprise that a design approach that seeks to understand how people are already using technology, and to design and evaluate technology that is responsive to that, is best served by qualitative methods. At all points in this thesis, qualitative methods such as thematic analysis, design workshops, storyboarding, discussion and interviews have helped me to develop an understanding of communities and practices to both inform my designs, and evaluate them post deployment. Whilst quantitative methods have been used to establish participation metrics and to give overviews of patterns of engagement (particularly early on in my research journey), I have found that the deepest (and therefore most useful) insights have come from gaining a critical understanding of existing practices and communities through qualitative work. As detailed above, effective use of the unplatformed design model depends on these, therefore, it is also underpinned by the types of discursive, inductive and exploratory methods I have used within this thesis.

7.6 Research Questions

Throughout this thesis I have been guided by three research questions. The first is broadly empirical, concerned with inquiry into the real-world design and deployments of participatory processes supported by appropriated social media technologies. The second is broadly conceptual, concerned with the formulation of a model of appropriation that accurately and productively charts the design space of designing with social media technologies. The third addresses the translation of these conceptual findings towards design in practice.

RQ1: How can existing social media technologies be appropriated in support of engagement and participation?

With this question in mind, in chapter 2 I examined existing research into the appropriation of social media technologies. This began with a discussion of work around the increasing importance of social media in how people construct their own political and social identities, in respect to civic engagement. I then looked at three disparate domains of engagement and participation (*politics, health and education*), and at prominent examples of social media appropriation in each. I identified that despite of (and perhaps because of) the wide variety of applications and contexts, there exist a number of significant challenges to the successful appropriation of social media technologies for engagement and participation. I proposed these to be: i) a need for a consistent conceptual understanding of how to design participation with social media; ii) a need for a more fine-grained understanding of social media technologies; and iii) a need for direct guidance on how to appropriate social media in the context of real-world problems.

In chapter 3, I attempted to address these challenges, and further investigate RQ1, through the practical design and deployment of WhatFutures. This chapter described the design process of WhatFutures, a large-scale, WhatsApp-based participatory future forecasting engagement in collaboration with the International Federations of Red Cross and Red Crescent Societies. As well providing a detailed example of how WhatsApp can be appropriated for the purposes of engagement, I also addressed RQ1 through a reflection on the design process whereupon I identified the qualities of WhatsApp that lend it so well to coordinating participation at such scale.

Chapter 4 began with two additional, and thorough, examinations of case studies of appropriation. The first, Asynchronous Remote Communities (ARC)(MacLeod et al., 2017) used Facebook to perform participatory health research, whilst Online UWC (Celina et al., 2016) used existing social media technologies as infrastructure for online learning. These detailed case studies are compared and contrasted with WhatFutures to give a fuller picture

of how social media can be appropriated in support of engagement and participation in response to RQ1. By thinking systematically about the design choices in each of these studies, I gained insight into the overall design space of social media appropriation in support of engagement and participation. This understanding of how social media has been appropriated in various ways, through the analysis of empirical studies found both in real world and research contexts in the previous two chapters, constitutes the empirical contribution of this thesis. This empirical understanding forms the foundation of the conceptual contribution that follows

RQ2: How can we reconceptualise social media technologies to make them more readily usable as a resource for the design of coordinated participation?

My investigation into reconceptualising social media technologies began in Chapter 3, where I proposed a primitive and WhatsApp-centric set of material qualities that I used to design WhatFutures. Due to the apparent successes of WhatFutures in terms of engagement reach and in creating and sustaining substantive dialogue, I argued for the potential that reconceptualising social media technologies as design material has for their use as a resource in the design of coordinated participation.

Chapter 4 constitutes the most significant investigation into this research question. It is in this chapter that I embarked on a project of refining and developing the initial material qualities of WhatsApp proposed during the design of WhatFutures, in order to make them more applicable and generalizable across social media technologies. In chapter 4 I also looked more closely at the notion of materiality, and introduced Paul Dourish's concept of the materiality of information (Dourish, 2017), where the way information is materially configured ultimately affects what can be done with it. Materiality is a particular important aspect of this thesis in that it is useful in looking 'beyond' typical ways of viewing the use of social media (e.g. features, functions and content), and therefore makes social media more amenable to a design process and the model more generalizable across platforms.

I used my findings from RQ1 along with this more refined conception of materiality to formulate the model of unplatformed design. The model consists of 4 material qualities: *morphology, role, representation of activity and permeability*, and 3 operations of how they can be manipulated or otherwise employed: *configuration, hard augmentation and soft augmentation*. See table 11 for a summary. The model directly responds to RQ2 as a coherent and systematic reconceptualization of social media technologies, which I claim has both pragmatic and descriptive utility within design. In this way the unplatformed design model situates social media technologies as more readily usable as a resource for the design of coordinated participation. The model acts as a significant contribution of the thesis. In more detail this conceptual contribution consists of i) the model of *unplatformed design* and ii) a conceptualisation of social media as design material.

RQ3: How can a model of appropriation of social media technologies for coordinated participation be applied in practice?

As well as presenting the unplatformed design model in chapter 4, I argued that the model has both descriptive and pragmatic utility within design. This utility was founded on the creation of a new set of terms around the materiality of social media technology, that could be used to more thoroughly expose and examine the design space and design potential of social media technologies in respect to coordinated participation.

In order to test this claim, in chapters 5 and 6 I applied the unplatformed design model into two separate design processes in two different contexts. In these two chapters I underwent the bulk of investigation into RQ3. In the first, chapter 5, I describe in detail the design process and deployment of a social media-based peer support system for extreme weight loss as part of diabetes management in Barbados. This contributes more empirical investigation of RQ1, but primarily as a practical application of the unplatformed design model proposed in the previous chapter. The following chapter 6, continued this work by using the model to formulate design recommendations for social media use in language learning and teaching. Across both these studies, I found that social media technologies can be more successfully

appropriated for participation when they are designed sensitively to their use in everyday life, either by *blending in* and/or by *prioritising authentic communication*. In particular these studies brought to attention how a deep understanding of both the community you are designing for, and the domain you are designing within, are crucial for using the unplatformed design model to make design decisions.

These reflections are developed most full in this chapter, where in responding directly to RQ3, I discuss in detail the utility and implications of the unplatformed design model when applied in a design process. Here I proposed a number of clarifications of the model's material qualities in order to make them more useful and precise within the design of coordinated participation. Following from a discussion on the relevance of Wenger's communities of practice in unplatformed design, I also proposed an expansion of the model with the addition of guidelines for application of the model. I pointed to Lee et al.'s Model of Coordinated Action as an initial starting point for future work in generating these guidelines.

Lastly, I entered into a reflection on the implications of the unplatformed design approach as a whole. I argued that the appropriation of social media technologies for coordinating participation, when applied creatively and thoughtfully, is potentially a flexible, efficient and accessible way to improve engagement reach whilst building the capacity for researchers and organisations to respond to real world needs. I then discussed three significant challenges to unplatformed design going forward, namely lack of control over digital infrastructure, the unforeseen consequences of algorithmic decision making, and the debatable ethics of large social media corporations.

7.7 Contributions

In summary, through this thesis I have made the following contributions:

- **A conceptual contribution**, with i) a reconceptualization of social media technologies as design materials with material qualities, resulting in ii) the model of *unplatformed design*. The model consists of 4 material qualities: *morphology*, *role*, *representation of activity* and *permeability*, and 3 operations of how they can be manipulated:

configuration, hard augmentation and soft augmentation. The model constitutes the primary conceptual contribution of the thesis, and acts as a conceptual framework that makes social media technologies more readily usable as a resource for the design of coordinated participation.

- **An empirical contribution**, with a detailed review of how social media has been appropriated in various ways and in various contexts, through the analysis of empirical studies found both in research and in the real world in chapters 2 and 4. Specifically the novel account and examination of three empirical case-studies in chapter 4 in terms of establishing the unplatformed design model. Furthermore, chapters 5 and 6 provide summaries of key learning from data gathered from two design processes, in order to illustrate the value of the model on how it creates specific kinds of participation. Although the utility of appropriation of social media technologies was clear within this analysis, this survey of empirical work identified how ad-hoc and emergent practices as to appropriation lack a systematic understanding or unified approach to appropriation. This empirical understanding forms a foundation of the conceptual contribution.
- **A methodological contribution**. With detailed descriptions of how unplatformed design can be employed in the design of systems in three very different contexts (future foresight, peer support, language learning) in chapters 3, 5 and 6. This methodological contribution includes detailed, multi-phased, accounts of workshops and activities and includes descriptions of a novel card sorting/graphing activity used in both chapters 5 and 6 to generate design insight using the unplatformed design model.
- **A design contribution** with detailed description of the design, development and deployment of WhatFutures. Primarily this is a social design contribution, towards the design of social processes that enable participation and engagement. This includes an account of how WhatsApp can be configured and augmented to engage with a large distributed global population (chapter 3). Additionally, the design, development and deployment of a social media-based peer support system for weight loss in a health context, again using WhatsApp (chapter 5). Both these design contributions include reflections upon how the design may be improved on further deployments.

7.8 Limitations and Future Work

There are of course limitations and future work to be accounted for in progressing and developing the unplatformed design approach.

Primarily, I acknowledge that although the model of unplatformed design presented in this thesis is concerned with the material qualities of all social media technologies, two major case studies in this thesis are both built on WhatsApp. The model itself was constructed through a reflection of case studies of multiple social media types (Facebook, WhatsApp, Google Hangouts amongst others), but in terms of application a full design development and deployment has only taken place with a system based on WhatsApp (the case study in chapter 6 concerns all social media technologies, but did not have a deployment). This may imply the existence of issues around the replicability of these results with other unplatformed design processes using non-WhatsApp social media technologies.

This is a clear direction for future work, which should look to apply the unplatformed design model in the appropriation of other social media technologies. In particular, I would look at how the model can be applied to the appropriation of more image and video oriented social media technologies such as Instagram¹⁵ and TikTok¹⁶. This will help to further clarify and validate the model, whilst reinforcing the replicability of results and the broad applicability of the model in general. However, it should be said that the reason WhatsApp was favoured in the case studies of this thesis, is that it was by far the most popular and widely adopted social

¹⁵ <https://www.instagram.com>

¹⁶ <https://www.tiktok.com/en/>

media technology by participants. As such it followed the ideal of following communities to the technologies they are already using. Therefore, although I suggest that future work should look into other social media technologies, I would strongly recommend that this should only be done when that technology is appropriate for intended participants, and not in a way that loses sight of the motivations for unplatformed design in the first place (lowering barriers to engagement, improving reach etc).

A second limitation, and one that emerged through the process of reflection detailed above, is that the unplatformed design model has primarily been applied by myself. This has potential implications on its utility, when it is wielded in another designer's hand. In response to this there are 2 directions future work could look at. The first, most obviously, is that the unplatformed design model should be used by other designers who seek to appropriate social media technologies in the design of coordinated participation. This will certainly bring attention to those areas of the model which require more practical clarity, but may also highlight aspects and applications of the model that I had not conceived of. The second direction is for future work to expand and improve the model through the development of guidelines as described earlier in this chapter. Each guideline would take an understanding of community and/or domain and an understanding of the desired behaviours of the coordinated participation, and suggest a corresponding recommendation as to how these understandings could be taken into account by unplatformed design. It is my opinion that this would widen the accessibility of the model and improve its applicability.

Another related concern is in regards to the *hard augmentation* of social media technologies, referring to the introduction and combination of additional technologies (e.g. the external leaderboard website in WhatFutures). Although I have made much of the claim that unplatformed design is both democratic and accessible to the non-technical, questions of hard-augmentation are not quite so clear cut. The vast majority of programmatic interaction and automation with social media technologies takes place through application programming interfaces (APIs). All though generally much more accessible to the non-technical than creating bespoke software, use of APIs does require some computing and technical

knowledge. As such, a fruitful direction for future work would be the creation of tools that make the hard augmentation of different software and tools easier. This could be the creation of 'middleware' (software that provides services to applications beyond those typically available, often described as "software glue"); templates that helpfully suggest options as to hard augmentation (e.g. which database to append to Twitter); tools that assist in the automation of data input and output (e.g. automate parsing of WhatsApp chat export .txt files); dashboards and toolsets for managing and organising morphologies and roles (e.g. ways of visualising the connections and relationships between people); and generally anything that expands the functionality of social media technologies in a way that makes appropriation and coordinating participation easier and more accessible.

It may seem contradictory to advocate for the creation of bespoke tools for the purposes of supporting a design approach that is based on appropriating existing technology. However, the types of software described above are geared towards supporting the designers and coordinators of digital engagements, who generally have a vested interest in learning bespoke software for the purposes of the engagement as opposed to participants. Of course, in order to support unplatformed design as an approach accessible to the non-technical, any tools or middleware will have to be designed with this forefront in mind.

Lastly, the forms of participation that are designed within this thesis represent just a handful of possible configurations of participation. Vine et al. (Vines et al., 2013) identify three key issues in participation that should be considered: *forms of participation*, referring to the differences between timescales, locations, engagements; *initiators and beneficiaries*, referring to question of who benefits and who should or should not participate; and *sharing control*, referring to issues of expertise and control of a process. In light of the ethical challenges discussed within this chapter and chapter 2, going forward it is important to think carefully about participation and its implications, as enacted through unplatformed design.

In summary I identified the following directions for future work: 1) further application of the model on a wider set of social media technologies; 2) further refining of the utility of the

model through reflective application by other designers and the generation of practical guidelines; 3) the creation of tools, templates and middleware to make hard augmentation of social media technologies more accessible; and 4) deeper and more critical engagement with the forms of participation enabled through unplatformed design.

7.9 Concluding remarks

The widespread pervasiveness of social media technologies, has led for them to be increasingly adopted into civic life, it is becoming commonplace to use communication apps like WeChat and WhatsApp to communicate with employers, colleagues, teachers, businesses, doctors and more. In this thesis I set out to explore the different ways in which popular, widely adopted social applications can be creatively reused and how they can be resourcefully reapplied to new contexts. Ultimately this involved a reconceptualising of social media, intended to break through intended usage patterns, that repositioned social media technologies as *design material*. Material from which new patterns of participation, engagement and interaction can be shaped, structured and supported.

The model for unplatformed design at the heart of this thesis, is a model that is built from this reconceptualization. The demonstration of its utility for making social media technologies more readily usable as a resource for design can be found in its application within the design processes of a WhatsApp based peer support system for extreme weight-loss as part of the Barbados Diabetes Reversal Study 2, and in the early stages of a design process for a peer-led social media-based language learning system.

However, the studies detailed in this thesis are just the start of a project of unplatformed design that will continue to investigate new contexts and new ways to effectively appropriate social media technologies in the design of coordinated participation. I hope in further work to close the gap between an understanding of community and domain, and the application of the unplatformed design model. I hope to do this in a way that broadens the accessibility of this approach, so designers and non-designers alike can more easily harness the potential of appropriating social media technologies for coordinated participation. This potential, as I

have hopefully demonstrated throughout this thesis, is the potential to improve the reach, usability, flexibility, resource cost and overall capacity of the digital engagements and participatory processes that we design.

Lastly, I would like to say that more than anything else, unplatformed design is an approach that questions many ingrained assumptions not only of the ways in which we use technology, but also of the ways we build technology. Instead of responding to the challenges of participation with the building of yet more technological solutions, unplatformed design instead suggests that we might go where people already are participating, speak with them in a voice they understand, and blend comfortably with their everyday lives. It asks us to place our trust in people to know what is right for them.

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Appendix A WhatFutures Supplementary Material

Appendix A.1 WhatFutures One Page Synopsis



WhatFutures is an innovative and massive multiplayer future forecasting game, played entirely over WhatsApp. It is designed to engage IFRC's young volunteers in sharing their hopes and fears for the future, and to include these voices in shaping IFRC's Strategy 2030.

Using the future to change the present.
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About
WhatFutures is played in small teams, who work together on fun, interactive challenges that show potential scenarios of the future. They will make videos, record audio and take photos, to capture their thoughts and feelings around the risks and opportunities that their futures present, and how the IFRC can meet them.

How does it work?
In partnership with researchers from **Open Lab, Newcastle University**, a pilot of the game will be run with two National Societies simultaneously in early June 2017. A global rollout will follow in September, building on the pilot.

We expect **200-400 volunteers** taking part in the pilot.

Each game will have **3 creative challenges** that seek answers to:

- » **What challenges will we face by 2030?**
- » **What opportunities will there be by 2030?**
- » **How does the Red Cross and Red Crescent have to change to meet these challenges and opportunities?**

Each player in the game will also choose one of **four specific roles**. In these roles players will interact with a larger global inter-team with others playing the same role. They will also get access to specialised information on trends and issues relating to their role through an online global conference.

Each game requires **3-4 game administrators** to help run the game, and support uploading and distribution of game content.

The game will be complemented by a website which:

- Acts as a publicly accessible online repository of all the rich multimedia content generated during the game.
- Serves as the main method players sign up to the game and consult the leaderboard for each challenge.

For more information, contact
innovation_team@ifrc.org

soferino academy



Become a future guide!

We are looking for enthusiastic volunteers to act as **Future Guides** for our innovative new game **WhatFutures**. WhatFutures is a large-scale game that is played by hundreds of volunteers at the same time, **all through WhatsApp**. The game is played in small teams, who respond to challenges by making videos, images and recording audio. We are looking for Future Guides to help support these teams by helping to run the game, and acting as the first point of contact for players who need help or who have questions.

The role of a Future Guide is very important, and includes attending a **short training session in late May, and supporting the game from the 9th - 18th June**. Supporting the game will include using WhatsApp for short scheduled bursts of activity, such as posting out information to WhatsApp groups and collecting player's responses, as well as answering questions and offering help when needed throughout the game. To be a Future Guide you will need the following:

- ▶ Your own smartphone and phone number
- ▶ A WhatsApp account
- ▶ A Google account
- ▶ Access to a reliable wireless internet connection
- ▶ A desire to help people, and to be an important part of an exciting and innovative new game about the future of humanitarian need.

If you are interested, then contact us at innovation.team@ifrc.org

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Appendix A.3 Future Guide Training Documents



Future Guide Jobs and FAQs

Setting up teams

NB: this is easier to do when using a laptop or desktop computer

1. To set up teams you will need to have logged in to whatfutures.org/admin with your google account. We will send the player contacts to your google contacts before the game begins.
2. Visit <https://contacts.google.com> You should see the new players added to your contact list in a 'WhatFutures' group label on the sidebar on the left. As well as their name, the entry for each player also contains their team number (e.g. 'Team034' and their role (e.g. 'tech')
3. Click this group label, select all the players, (you can use the select all button at the top of the screen once you have selected a player), then click the 'add to contacts' button in the top right. Your contacts on your phone should be synced with your google account and so they should appear on your phone within a few minutes, as long as your phone is connected to the internet. If they do not appear, get in touch with us.
4. Visit whatfutures.org/admin to view the list of teams you are supporting. Each team will have a list of players. You will need to create a new WhatsApp group for each team.
5. Open WhatsApp on your phone or visit <https://web.whatsapp.com/>
6. Select the menu icon, and choose 'New Group'.
7. The group should be called 'WhatFutures – Team X', where the X is the number of the team (e.g. 'WhatFutures - Team034') For example Add players to the group by searching for them using the search bar. You can search by a player's name, or by team (e.g. Team034). You can use the team list in whatfutures.org/admin to help you. You can leave the picture for the group icon blank.
8. Once the group has been set up, you should post the welcome message in the group. This message explains what the game is about, how to ask for help, and what to expect in the game. It should be sent to you by the Super Admin in the Future Guides group on WhatsApp.
9. Repeat 6-8 for each of your teams

Troubleshooting

Q: The player contacts aren't on my phone.

A: This could be because they haven't been sent to your phone yet. We will be sending them close to the start of the game.

This could also be caused by your google account not being synced with your phone contacts. Have a look in your contact settings to make sure that your google account is synced. If you need help with this, ask in the Future Guides group on WhatsApp.

Q: Some of the players in a team are missing from my contacts and can't be added to the WhatsApp group.

A: This could be caused by lots of reasons. Double check your spelling of the player's name or try searching for their phone number. If the player is still not available, it could be that they are not using WhatsApp. In this case, create the team as normal, and contact us through WhatsApp or email with a note of the missing player's name(s) and the team(s) they are in.

Q: I've given the group the wrong name!

A: That's ok, you can rename a group at any time from the group info option in the group's menu.

Q: The team have changed the group name and/or picture!

A: This is completely fine. Players can name and change their group icon any time they want to. You should always remain the admin.

Q: Where is the welcome message? How do I post it?

A: The welcome message should be sent to you in the Future Guides WhatsApp group, or directly from the games Super Admin. You can post it by forwarding it to the new groups, or by copying and pasting the content.

Posting a challenge

1. Challenges will need to be sent to all teams at the same time. You can use WhatsApp on your phone or <https://web.whatsapp.com/> to do this.
2. Select the challenge message that you want to post. This will be sent to you by the Super Admin and should usually contain an image and some text.
3. Click the forward arrow icon to the right of the message.
4. Select all of your teams as recipients.
5. Once you have selected all your teams, hit the send button.

Troubleshooting

Q: I can't find the challenge message.

A: The welcome message should be sent to you in the Future Guides WhatsApp group, or directly from the game's Super Admin. If you can't find it, contact the Super Admin or ask in the Future Guides WhatsApp group.

Q: I can't remember which WhatsApp groups are teams.

A: Use whatfutures.org/admin to help you identify all the teams by the players that are in each group. You should post out the challenge to every team that you are supporting.

Uploading team challenge submissions to Google Drive

1. Team submissions should be either a video, audio file, document or an image that is posted in WhatsApp group. Select the submission by tapping it or holding down.
2. Choose share in with drop down menu or tap the share symbol. On Apple devices tap the 'forward' icon, then tap the share icon.
3. Choose the 'save to drive' Google Drive icon. On Apple devices this may just be called 'drive'. You might have to scroll to find it.
4. You don't need to change the document title, but do make sure you have the google account you registered with selected under 'account'.
5. Choose the correct folder in the Google Drive for that team and for that challenge (e.g. Team 006 – Challenge 2)
6. Tap save.
7. Repeat 1-6 for every team that have made a submission

Troubleshooting

Q: I can't tell what a team's submission is.

A: Teams should tag you into their submission by using '@'. If they haven't then why not ask the team. They should be able to repost their submission or clarify which one it is.

Q: A team has not made a submission for a challenge.

A: That's ok, not all teams will respond to every challenge. If you want to, you could ask in the team if they want to make a submission to give them some extra time?

Q: A team has made more than one submission to a challenge.

A: Tell the team that they must choose one submission. If they can not or do not choose, then you are free to make the choice!

Q: A team has made a submission to a challenge that is just a WhatsApp message.

A: Unfortunately the submission has to be either a video, audio file, document or an image that is posted in WhatsApp group. Ask the team if they would like to resubmit.

Q: I can't find the 'save to drive' Google Drive icon.

A: Most likely this is because Google Drive is not installed on your phone. In this case you can download it from <https://www.google.com/drive/download/>. Make sure you sign into it with the same Google account you are using for the game.

Q: I can't find the correct folder in the Google Drive.

A: The folders should be arranged by team and then challenge number, all contained in a shared folder titled with your name. If you can't find it, try filtering folders by 'shared with me' or looking at 'recent' folders. If you still can't find it or you think the correct folder is missing, then contact us via the WhatsApp group or by email.

Q: I have Google Drive, but I can't find any of the folders.

A: The folders should have been shared with the Google account you signed up with. Check your Google emails for notifications and make sure you are accessing Google Drive with the correct account. If this doesn't work, then contact us via the WhatsApp group or by email.

Exporting conversations

NB: You can only export conversations using the WhatsApp app, and not the web browser. Make sure you have a wifi connection, as this stage involves sending larger files.

1. Using WhatsApp, open the group chat for the team you want to export.
2. On Android devices, tap the menu button on the top right. On Apple devices, tap the group name at the top of the screen, to open up the group info screen.
3. On Android devices, select 'more', then select 'email chat'. On Apple devices, scroll to the bottom and tap 'export chat'.
4. Select 'attach media'
5. Choose the email provider you prefer, ideally your google mail along with the subject as '.....'
6. Enter admin@whatfutures.org as the recipient
7. Click send!
8. Repeat 1-7 for each of your teams

Troubleshooting

Q: I don't want to send large files through my phone connection.

A: We recommend using a wifi connection on your phone to perform this stage. If this is not appropriate, then contact us via the WhatsApp group or by email.

Q: The file size is larger than my email provider allows!

A: You can send emails up to 25mb with Gmail. If this is not enough then contact us via the WhatsApp group or by email.

Q: The email address you provided didn't work or sent an error message.

A: Double check your spelling of the email address and try again. If this still doesn't work, then contact us via the WhatsApp group or by email.

General advice

Q: Who's the super admin?

A: They will be the person who sets up the Future Guides WhatsApp group and who sends out the bulletins of content. If you are uncertain, ask in the Future Guides WhatsApp group.

Q: Someone is phone calling me on WhatsApp

A: You are under no obligation to answer any phone calls you receive from players or other admins on WhatsApp. Do not do anything that you are uncomfortable with.

Q: Someone is being abusive or publishing inappropriate content

A: Report their behaviour immediately to the Super Admin via a WhatsApp message. You should be the admin in the groups you manage. You can kick players out of any group for behaving inappropriately and you should do this if you feel it is necessary. Make sure you notify the Super Admin if you remove any player from a WhatsApp group.

WhatsApp has plenty of tools for blocking and muting people, so make sure you are safe.

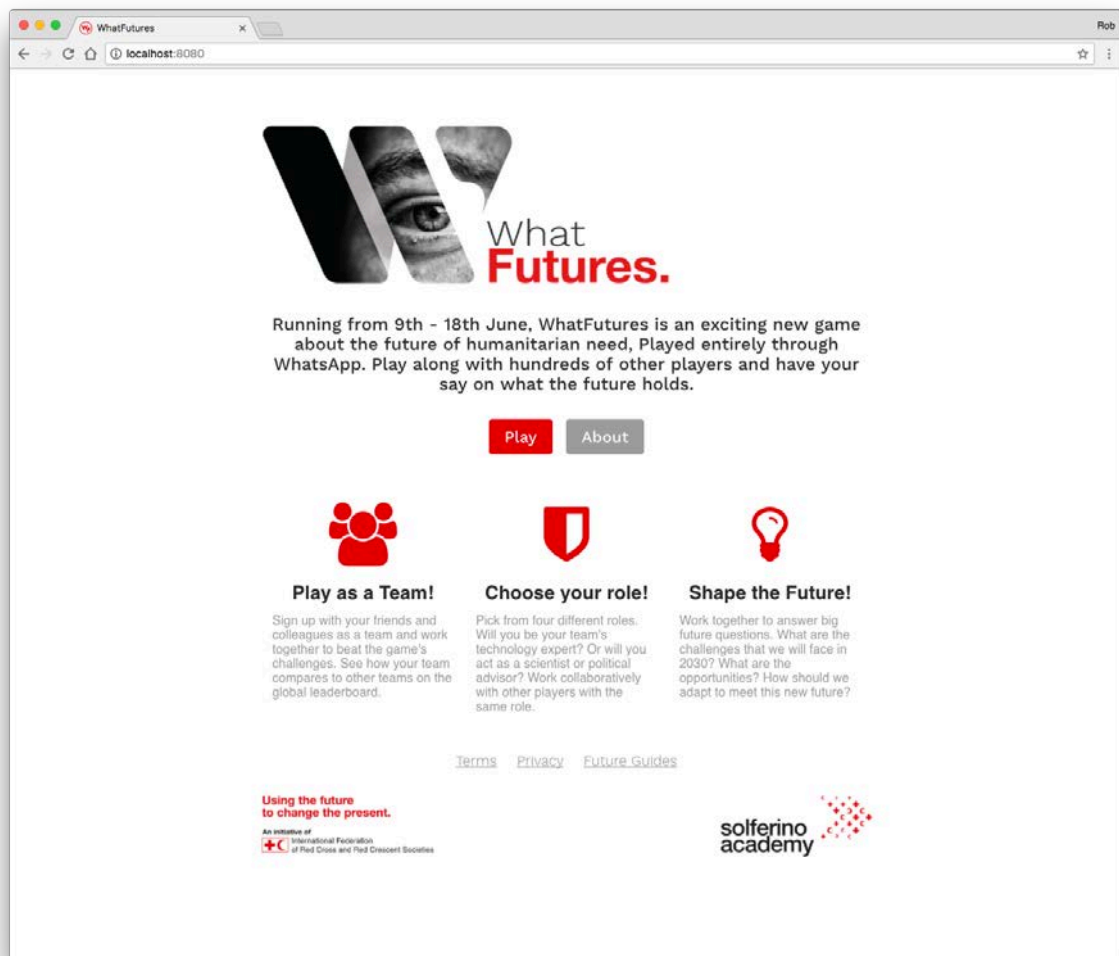
Q: What do I do if a player is reporting another player's inappropriate behaviour to me?

A: Same as above, report this immediately to the Super Admin and take action where necessary and possible. You can also advise players to use the block and mute functions on WhatsApp to keep themselves safe.

Q: A player has left a group, should I add them back in the group?

A: Players are free to leave groups and stop playing anytime they want. There is no need to add players back in to groups that they have voluntarily left.

Appendix A.4 WhatFutures Central Website Screenshots




WhatFutures

localhost:8080/game/1/register

WhatFutures. Play About

← Change Game







Test Game

WhatFutures is played in small teams of at least four players. Each member of the team chooses a role. Choose the role that most closely matches your interests and helps out your team!

Your role also allows you access to a special WhatsApp group, where you can play together with players from other teams who share the same role as you.


Choose your role

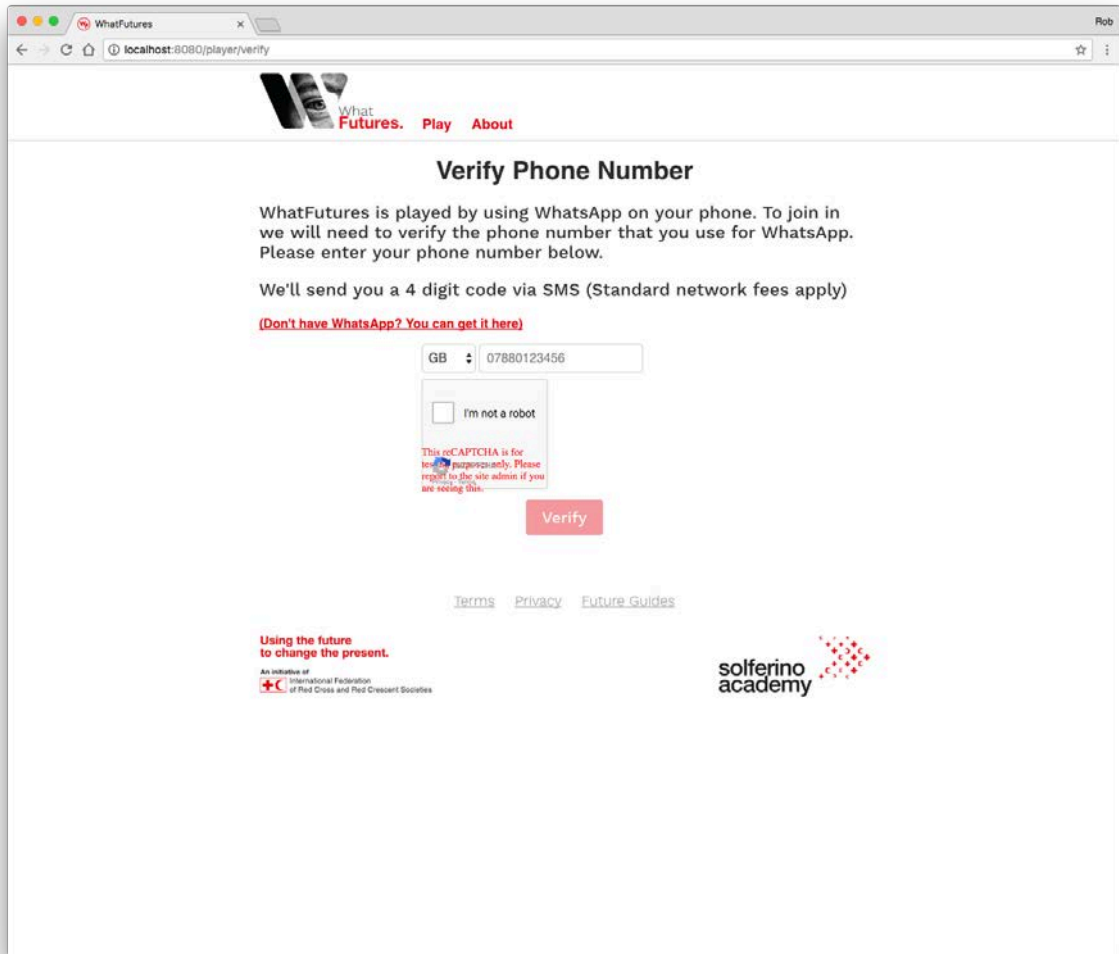
 <p>Technologist</p> <p>Duis mollis, est non commodo luctus, nisi erat porttitor ligula, eget lacinia odio sem nec elit. Nullam id dolor id nibh ultricies vehicula ut id elit.</p> <p>Pick</p>	 <p>Politician</p> <p>Fusce dapibus, tellus ac cursus commodo, tortor mauris condimentum nibh, ut fermentum massa justo sit amet risus. Cras justo odio, dapibus ac facilisis in, egestas eget quam.</p> <p>Pick</p>	 <p>Religious</p> <p>Praesent commodo cursus magna, vel scelerisque nisi consectetur et vestibulum id ligula porta felis euismod semper.</p> <p>Pick</p>	 <p>Scientist</p> <p>Fusce dapibus, tellus ac cursus commodo, tortor mauris condimentum nibh, ut fermentum massa justo sit amet risus. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus.</p> <p>Pick</p>
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WhatFutures

localhost:3000/team/code/5

localhost:8080/about



[← Back](#)

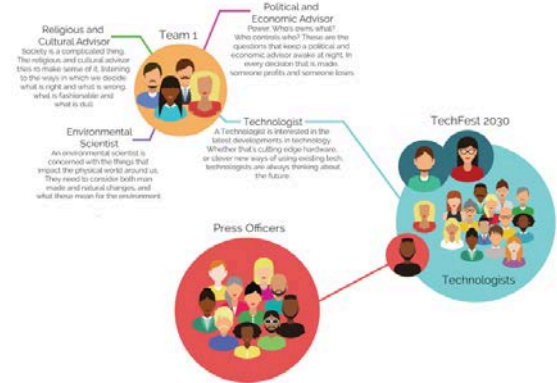
About

What is WhatFutures?

WhatFutures is an innovative and large-scale multiplayer future forecasting game, played entirely over WhatsApp. It is designed to engage IFRC's volunteers in sharing their hopes and fears for the future, and to include these voices in shaping **IFRC's Strategy 2030**.

WhatFutures is played in small teams, who work together on fun, interactive challenges that see players using WhatsApp to make videos, record audio and take photos, to capture their thoughts and feelings around the risks and opportunities that their futures present, and how the IFRC can meet them.

How do you play WhatFutures?



Religious and Cultural Advisor
Society is a complicated thing. The religious and cultural advisor tries to make sense of it, listening to the ways in which we decide what is right and what is wrong, what is fashionable and what is not.

Political and Economic Advisor
Power. Who gets what? Who controls who? These are the questions that every political and economic advisor make at night in every decision that is made, someone profits and someone loses.

Environmental Scientist
An environmental scientist is concerned with the things that impact the physical world around us. They need to consider both man-made and natural changes, and what these mean for the environment.

Technologist
A technologist is interested in the latest developments in technology. Whether that's cutting edge hardware, or above new ways of using existing tech, technologists are always thinking about the future.

Press Officers


TechFest 2030

Technologists

WhatFutures is played in small team WhatsApp groups. Each team member has a specific role to play, which allows them access to a larger WhatsApp group composed of other players from other teams who share the same role. Players communicate with each other in these groups to discuss the challenges and opportunities of 2030. Teams work together to create video, images and audio to express their thoughts on the futures.

presented on the IFRC.org website as an evolving, realtime timeline of the game. To

WhatFutures | localhost:3000/team/code/5 | localhost:8080/admin#



WhatFutures. Play About

Future Guide Dashboard

From here you can view the teams and players you support. Use the buttons below to help with running the game. If you've got any questions, read the FAQs or contact us at admin@whatsfutures.org.

Actions

[Launch WhatsApp](#)
[FAQs](#)
[Contacts](#)

Your Teams

Test Game – Team 1

Name	Role	Number
Player A	Technologist	+447880714261
Player B	Politician	
Player C	Religious	
Player D	Scientist	

Test Game – Team 3


Name	Role	Number
Player I	Technologist	
Player J	Politician	
Player K	Religious	

Test Game – Team 5

Name	Role	Number
Player P	Technologist	
Player Q	Politician	
Player R	Religious	
Player S	Scientist	

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CHALLENGE 1



WORK WITH YOUR TEAM

Produce a news story from 2030 about the biggest challenge facing your society. You can write a story (perhaps you could produce a front page of a newspaper or web article), record a radio show or interview, or create a TV news broadcast with video.

WHAT'S THE HEADLINE?

●

What are people in 2030 worried about?

What are the struggles of the future?

What are they working to overcome?

What's the main event or thing that everyone is talking about?



CHALLENGE 2



WORK WITH YOUR TEAM

Create an advertisement for an innovation in 2030. It could be a new product, service or initiative. Imagine what opportunities will exist in 2030 that could make your creation work. The innovation should help to address some of the challenges you have explored in the game so far.



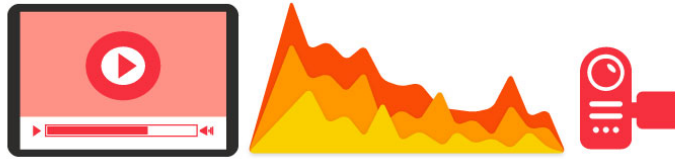
You could design a billboard, record a podcast, TV ad or any other advertisement for your innovation.

*What has disrupted
"business as usual"
and created a better
future?*



**The most creative
and insightful pieces
will make it to the
leaderboard**

CHALLENGE 3



WORK WITH YOUR TEAM

It is 2030 and a massive disaster has struck and caused catastrophic damage to a region and its population. It is now 24 hours since the disaster has struck and you are in the field right at the centre of the impact working on the response. **You must send an audio or video report** to the Global Secretary General providing an update for her on how the response is going and what has been happening.



Some questions you might like to consider;

- What disaster just happened?
- What caused it?
- What Innovations or new ways of working are driving the response?
- How has the Red Cross and Red Crescent changed?
- What is going well in the response?
- What isn't?

Appendix A.6 WhatFutures Conference Descriptions

Note that these Conference headers were posted at the 'opening' of the Conference WhatsApp Groups in WhatFutures. The 'Hot topics' were provided by the IFRC whereas I produced the copy.



What Culture.

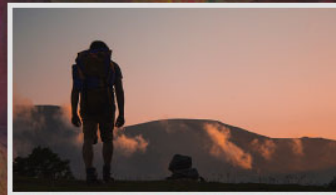
Welcome to C2030!

This conference is a space where all the players in this game with the cultural roles can come together and explore future changes related to culture and society. You can chat with and learn from other players from around the world. The conference will also have videos, stories, infographics and papers from global experts. Use these resources to help guide your team challenges. Enjoy!

Hot topics for this conference



Internet has made social change easy to organize



Global Travel 2030



FUTURE OF RELIGION

What does the future of religion look like?



Govern land as a global commons

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of Red Cross and Red Crescent Societies

solferino
academy 



What Environment.

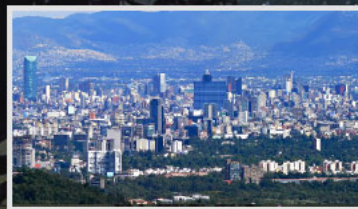
Welcome to E2030!

This conference is a space where all the players in this game with the environmental roles can come together and explore future changes related to things that affect the world around us and their underlying causes. You can chat with and learn from other players from around the world. The conference will also have videos, stories, infographics and papers from experts around the world. Use these resources to help guide your team challenges. Enjoy!

Hot topics for this conference



Earth Science
at 2030



Global forecasts of
urban expansion
to 2030



How can we make
the world a better
place by 2030?



Transforming Our
World: 2030
Agenda



What Politics.

Welcome to P2030!

This conference is a space where all the players in this game with the political roles can come together and explore future changes related to various political landscapes and how changes in political systems are transforming the world. You can chat with and learn from other players from around the world. The conference will also have videos, stories, infographics and papers from experts around the world. Use these resources to help guide your team challenges. Enjoy!

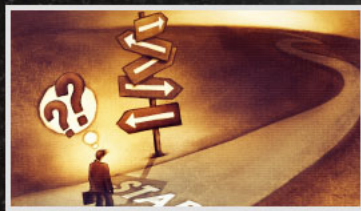
Hot topics for this conference



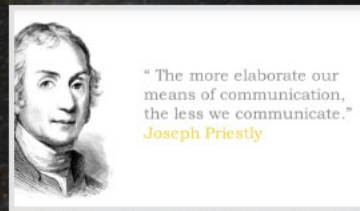
Democracy
futures lab



Future
Geopolitics 2030



Low-income
countries in 2030



Debating with
Billions: Politics in
the 21st Century

What technology.

Welcome to T2030!

This conference is a space where all the players in this game with the technologist roles can come together and explore future changes related to technology trends and emerging issues. You can chat with and learn from other players from around the world. The conference will also have videos, stories, infographics and papers from global experts. Use these resources to help guide your team challenges. Enjoy!

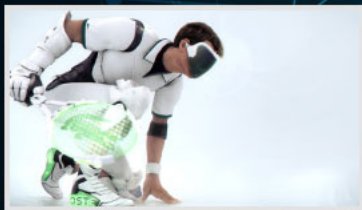
Hot topics for this conference



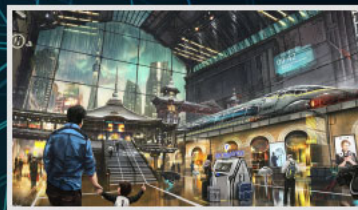
What Technology
Will Look Like
by 2030



7 amazing
technologies
we'll see by 2030



10 futuristic
technologies that will
appear by the 2030s



Digital Future 2030

Appendix B WhatFutures Global Game

In September 2018 We ran a global version of WhatFutures. These are some statistics and infographics produced by the IFRC



MORE THAN 3,000
YOUTH VOLUNTEERS
REGISTERED



ACROSS 120
COUNTRIES

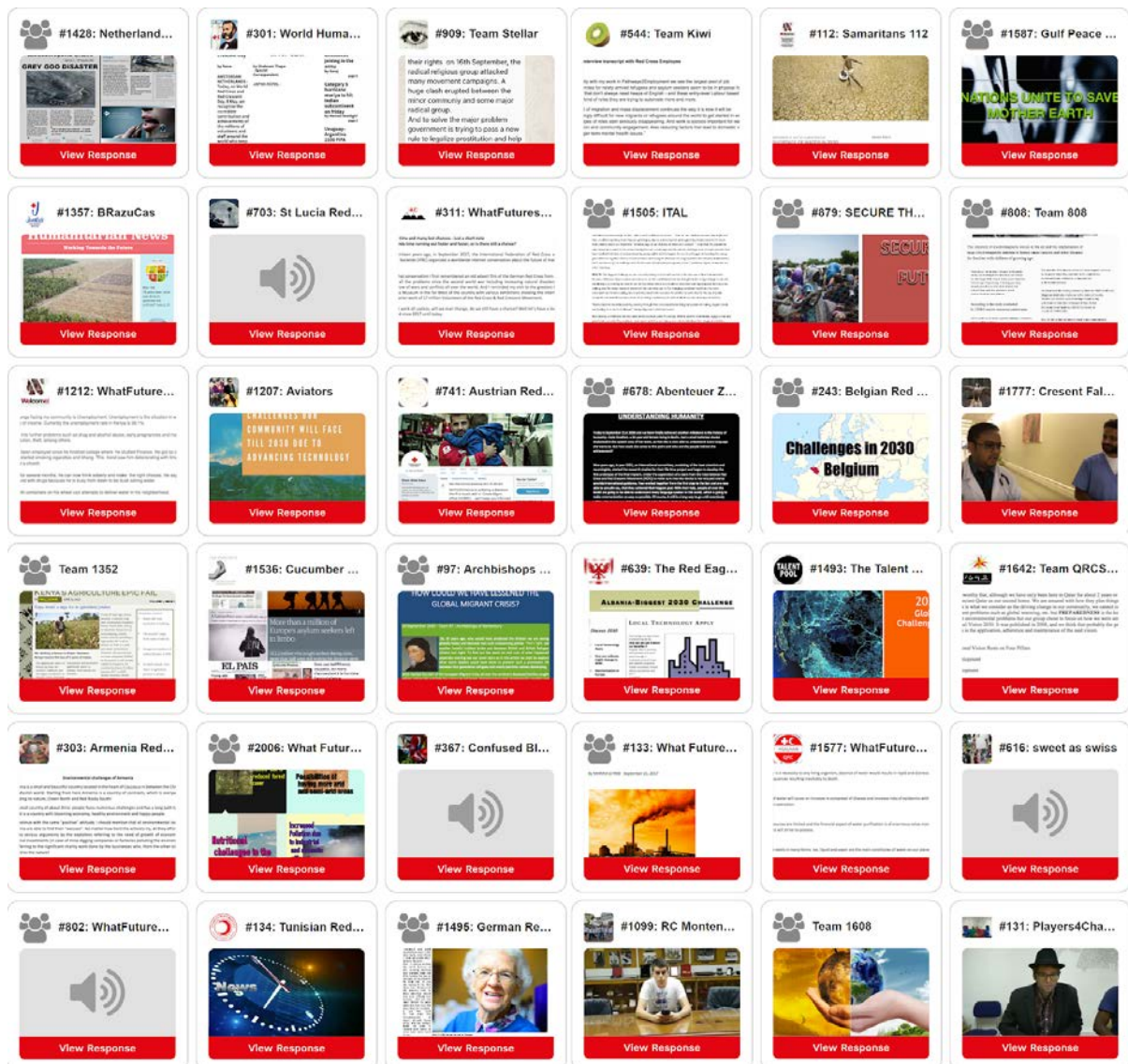


421
ONLINE TEAMS



MORE THAN 80K
MESSAGES ON THE
FUTURE OF HUMANI-
TARIAN NEED

Teams created 177 multimedia responses about the challenges facing their communities in 2030



Appendix C Barbados Diabetes Reversal Study 2 Supplementary Material

Appendix C.1 Design Workshop Consent Form



BDRS DESIGN WORKSHOP PARTICIPANT CONSENT SHEET

I can confirm that (please tick as appropriate):

- I have been given the opportunity to ask questions about the project and my participation in it. All questions have been answered fully to my satisfaction.
- I understand the workshop will be audio recorded.
- I understand that results from the workshop will be used to help design a digital support tool for health advocates on the Barbados Diabetes Reversal Study.
- I understand that anonymised information (without names) may be used as part of the writing of this research in academic publications and reports.
- I understand I can choose not to take part at any time without giving reasons and that I will not be penalised for this.
- I understand that my personal information will be treated as strictly confidential and handled in accordance with the provisions of the Data Protection Act 1998.
- I understand that other researchers who are part of this project can access the data providing they agree to preserve the confidentiality as specified in this form.
- I voluntarily agree to my participation

Participant's Statement:

I _____ agree that the research project has been explained to me to my satisfaction and I agree to take part in the study.

Signed:

Date:

















If you wish to contact the researcher, please use the details provided below:

Dan Howard
Open Lab, Newcastle University, UK
d.howard2@newcastle.ac.uk

Emma Simpson
Open Lab, Newcastle University, UK

Appendix C.2 Cards used in BDRS2 Design Workshop

 <p>Asking other Health Advocates for help if you don't know how to do something</p>	 <p>Asking other Health Advocates for ideas on how to keep your group motivated</p>	 <p>Encouraging people to post their diet progress to a group</p>	 <p>Encouraging people to talk honestly about times they have not stuck to the diet</p>
 <p>Checking messages at least three times a day</p>	 <p>Being available at all times of the day</p>	 <p>Asking someone else to monitor a group when you are not able to</p>	 <p>Sharing tips with the other Health Advocates about what works in your group</p>
 <p>Exporting the content of a WhatsApp group to send to the research team</p>	 <p>Making sure that the correct people are in a group together</p>	 <p>Collecting the WhatsApp phone numbers of everyone to add to a group</p>	 <p>Remembering to post regularly to a group</p>
 <p>Organising an event at your church for people on the study</p>	 <p>Planning an online discussion between people on the study</p>	 <p>Keeping track of the timeline of the study</p>	 <p>Planning a task (e.g. take a photo of..., record a video about...) for people to complete</p>

 <p>Sending encouraging messages to individuals</p>	 <p>Sending encouraging messages to groups</p>	 <p>Asking people how they are coping with the diet</p>	 <p>Posting recipe ideas to a group</p>
 <p>Posting exercise ideas to a group</p>	 <p>Encouraging people to seek support from their partners</p>	 <p>Organising others to share their tips for staying on the diet</p>	 <p>Sharing your story in a group</p>
 <p>Encouraging others to share their stories in a group</p>	 <p>Welcoming new people to a group</p>	 <p>Sending reminders to people about the clinical tests</p>	 <p>Asking if people need help using WhatsApp</p>
 <p>Sending individual messages if you've noticed someone has not contributed for a few days</p>	 <p>Recommending diet friendly places to eat out in a group</p>	 <p>Give tips on how to say no to people who are offering you food, without being rude</p>	 <p>Replying quickly to people who ask questions</p>



Peer Support on WhatsApp

A guide for BDRS Health Advocates

Contact

BDRS Lead
Kim Quimby

kim.quimby@cavehill.uwi.edu



INTRODUCTION

The restricted diet plan undertaken by participants on the Barbados Diabetes Remission and Prevention Study (BDRS) can be very challenging at times. Different people will react and cope in different ways. We believe that one of the best ways for people to cope with these challenges is through social support from their friends and other people who are in the same situation.

Why WhatsApp?

We believe that WhatsApp could be a useful tool for organising and delivering this support. We are researching if WhatsApp can be used to effectively help people stick to the BDRS diet.

What is this guide?

This guide is a bit like a tool kit for health advocates (HAs) who are taking part in the BDRS. It is designed to help health advocates support participants on the study, and each other, through the use of WhatsApp.

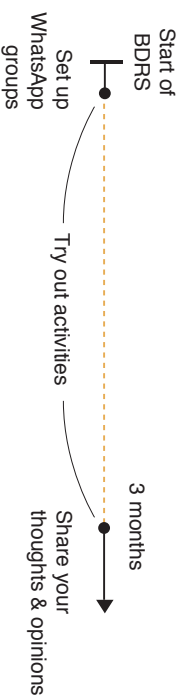
How to use this guide

This guide contains different activities that you can pick and choose from, to suit you and your group. Some of these activities will help keep participants motivated, some will help you give extra support to people who need it, and some will help you share ideas and tips with each other. All of them are designed to make taking part in the BDRS easier through peer support.

What we are asking you to do

As part of the study, we are asking health advocates to set up WhatsApp groups for participants. We are also asking you to set up a WhatsApp group for you and the other health advocates at your church.

The first 3 months of the study we will also be asking you to try a few of the activities in this guide. At the end of these months we ask your thoughts and opinions on how these activities have worked for you, and what we could do to improve them.



Any questions?

If you have any questions about the contents of this guide or the BDRS then please contact Kim Quimby (kim.quimby@cavehill.uwi.edu).

You can also contact the independent research ethics committee whose details are at the back of this guide.

SETTING UP WHATSAPP GROUPS

We would like you to organise at least 2 WhatsApp groups:

(a) HA group for the health advocates in your church
 Firstly, we would like you to create a HA group for all the HAs in your church (if you don't have one already!)

This group will be just for the HAs and should be used to organise between yourselves and help each other. We ask you to do this as it is useful to have an organising group separate from the main group.

(b) Main group (or groups) for the rest of the BDRS participants

We would then like you to set up a main WhatsApp group, or groups, with the rest of the BDRS participants in your church. This will be the group where you will support the participants, and where you will use the activities that are in this guide.

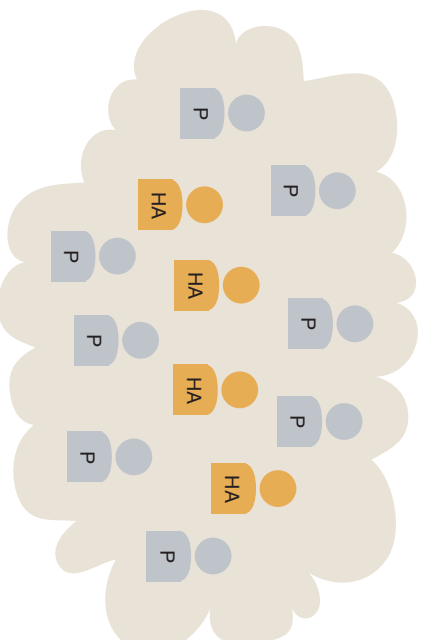
It is up to you how you set these up, as it depends on how many participants there are at your church and how comfortable people are being in groups together.

Look at the diagrams for some ideas of how to do this and speak with the other HAs to work out what will work best for your church.

Setting up the main group(s)

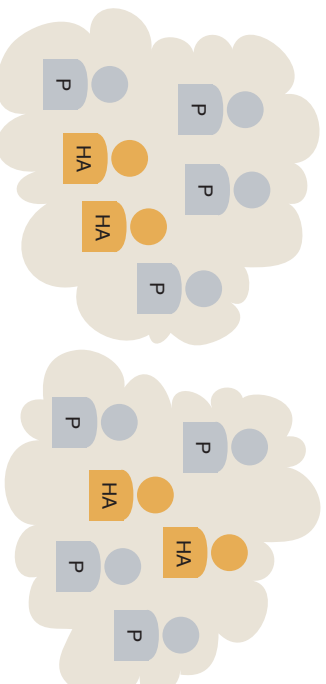
Everyone in together

All the health advocates (HA) and participants (P) in one big group



Small groups

Participants divided into groups, each with 2 or 3 HAs



MOTIVATION ACTIVITIES

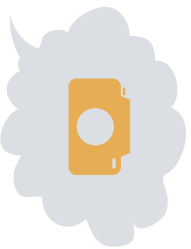
The activities in this section are for when you feel the group might need some extra motivation. Use these to get people talking, and to get people excited to be taking part.

Set a photo challenge

Why not ask everyone to take a photo of something and share it in the group? This is a good way of getting everyone engaged and interested. For example, you could ask people in the group to:

- Take a 'shake-selfie' of yourself with your meal-replacement shake!
- Take a photo of something that inspires you to stay on the diet.
- Take a selfie with someone who is supporting you during your weight loss.

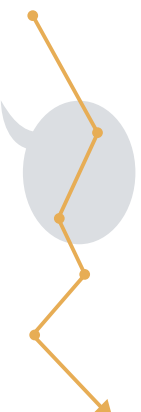
Or feel free to think of your own.



Weight loss progress

One idea is to encourage people to share their weight loss progress. You don't have to ask people to say how much or how little they have lost, but even asking people to honestly talk about their weight loss experiences can be really motivating.

For example, you might want to ask people to record these as an audio message saying how they are feeling on the diet. You could even ask people to do short (30 sec) video diaries. It is a good idea to do this regularly (e.g. once a week) as it can really help people to stay motivated.



Live discussions

One way of making people interested to take part in the group is to schedule a live WhatsApp discussion. To do this simply pick topic you think is interesting or relevant to the participants, and choose a time that people will be able to take part.

For example, you might say "from 7-8 this Wednesday we will be talking about the best ways of avoiding temptation with food." It is a good idea to prepare some group questions for people to respond to in this time. You could also ask an expert speaker to join the group, or hold a live question and answer session with someone from the health team.

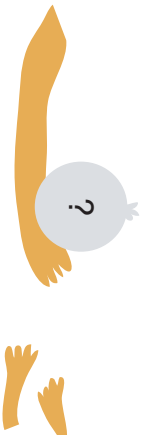


SUPPORT ACTIVITIES

The activities in this section are for when people might need a bit of extra support and help in sticking with the programme. Use these when you feel people are finding things challenging.

Asking how people are coping with the diet

It sounds simple, but remembering to regularly ask how people are coping with the diet is very important. Not everyone is comfortable speaking out, and this simple question can be enough to give someone who is struggling an opportunity to let you know.



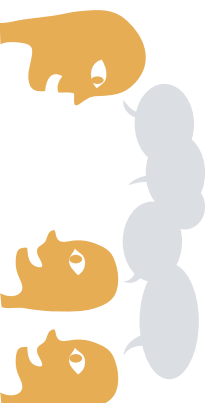
Following up

It is a good idea to follow up with people who have needed a bit more support. This could be sending them an individual message a week or so later, to ask if they are ok. Or it could be arranging to meet in person.

Story sharing

Sometimes when people are finding things challenging, it can be useful to hear from people who have had similar experiences. You could share your own story of when you have faced a similar challenge, or encourage others to share theirs. Sometimes, just hearing that you are not alone is enough.

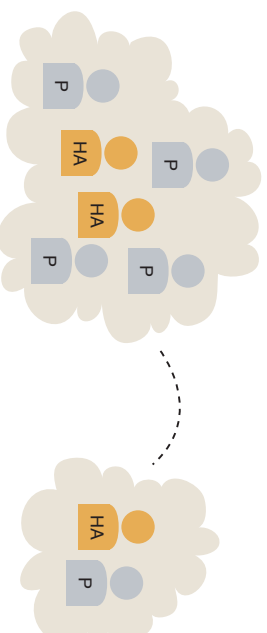
One way of doing this is to ask a different person in the group to share their story each week.



Break out groups

If you feel that someone might need a bit of individual support, try messaging them individually to see if they are ok. One idea, could be to start a separate 'break out' WhatsApp group with just yourself, the person, and one or two other people who you feel can help.

This gives you all a bit more privacy, but also gives the person a little more care and attention that they may need.



SHARING ACTIVITIES

The activities in this section are for when you want people to work with each other and to share their own ideas and tips. Use these when you don't know the answer to something but you're sure someone else will!

Sharing tips

Everyone is different, and within your group there will be many different ideas and perspectives on lots of things. You can use this expertise to create a shared resource that can help everyone.

For example, you might ask your group to:

- Share their exercise ideas
- Share tips on how to be creative with the meal replacement shakes
- Share tips for how to say no to people who are offering you food!
- Share healthy eating recipes or food preparation tips for the later stages of the diet
- Share places to eat that have healthy options.

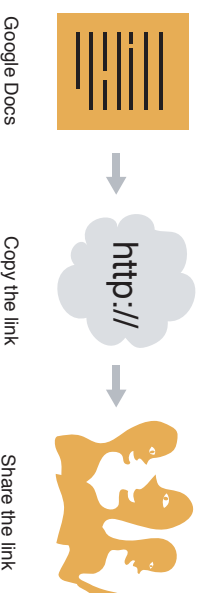
If everyone in your group shares one or two tips you will soon have quite a library of ideas.

Creating a shared resource

Once you have collected everyone's suggestions it is a good idea to put these all together in one place, as things can get easily lost on WhatsApp.

You might want to:

- Create a google document and copy and paste the suggestions. You can then share this document with everyone in your group with a link.



- Create an image file that contains the suggestions in one place along with some pictures. Like a meme, you can send the image file easily through WhatsApp.



FREQUENTLY ASKED QUESTIONS

Notes

What happens next?

We would like you to continue to use WhatsApp to support participants throughout the duration of BDRS. We will be in contact to get your thoughts and opinions on how you feel this is working, and what we can do to improve.

How many activities should we do, and how often?

It completely depends on what you think will work for the participants, and what will work for you and the other HAs. We would like you to do at least one activity a month, but whether you do more or less is your choice.

I'd rather not use WhatsApp.

That's fine. WhatsApp was chosen as it is the most widely used messaging app in Barbados. However, if there is something else you'd rather use, or nothing at all, this is not a problem. Just let us know.

What if I have concerns about the study?

If you have any concerns that cannot be answered by the research team then please contact the University of the West Indies—Cave Hill Research Ethics Committee at researchethics@cavehill.uwi.edu or 417-4847.

Appendix C.4 Sample transcripts from BDRS2 WhatsApp 'Main group' chat

4/12/19	7:02 PM	Gn , I am feeling the excitement.! Lovely! 🍌🍌🍌
4/12/19	7:08 PM	I love, I hope I can see <anon>, <anon>, <anon>, <anon>and <anon>dinner or daily meals also in between 🍌🍌🍌🍌
4/13/19	11:39 AM	🍌🍌🍌🍌 this is going to be fun.
4/14/19	1:43 PM	Taste better than I expect it would
4/14/19	5:16 PM	Girl after I drank the shake after 9...i was drinking water till I get home
4/15/19	1:23 PM	Am drinking a lot of water...so hence
4/15/19	1:24 PM	Not too long had cucumber soup...and was still hungry 🍌
4/15/19	2:30 PM	Question...is any one else hungry...even though they eat or drink they cup of soup or salad?
4/15/19	2:31 PM	It seems like you always hungry tho
4/15/19	2:33 PM	You expect a big woman to just stop eating a plate of food...to eating...a hand full of Bush..
4/20/19	11:51 AM	Just had my cucumber soup 🍌
4/21/19	5:09 PM	Princess <anon>how are you doing, any cucumber soup today
4/29/19	12:13 PM	I just got back home...so am hungry...🍌...having a cup of green tea with lemon
4/29/19	12:42 PM	The other day I wanted a piece of 🍌 pone from A1
5/3/19	11:49 AM	Greetings to all, this is three weeks I haven't eaten 🍌 rice, pasta l, chicken, fish, corn or casava pone, or drank juice or milk, signs of withdrawal coming, wuh lawd
5/3/19	12:18 PM	<anon>ur clothes falling off yet?...
5/4/19	3:09 PM	When I pass by <anon>I does smell the 🍌 pone from all in the road
5/5/19	1:04 PM	GD afternoon <anon>....how are u doing?...hope u feel better
5/10/19	7:46 AM	Greetings all, total veg soup this morning, having a 🍌 for lunch today. What do you eat when all the food gone, and you don't have the energy to cook?
5/14/19	7:42 AM	Good every body, how are the little kiddies, I hope you don't get to work late today, hope you all having a great morning thus far,now don't forget to draw the life line.
5/14/19	7:53 AM	I'm liking the results thus far, the excitement got muh
5/14/19	8:12 AM	I am going though so many things. Pain from a work related injury and my stomach just does it own thing. Today I am feeling different things but I am alive and struggling on
5/14/19	8:14 AM	No <anon>, not struggling, progressing
5/15/19	12:04 PM	You two really light up my day with your banter🍌🍌🍌🍌

5/15/19	1:33 PM	<anon>, girl, wuhloss, the texture of the food was great, not mushy not too hard,but, it tasted well, but, I love the spirit in which it was done, but,but my god Ann, the pepper oh lord the pepper, muh mout pun fyah murduh gal muh mout
5/18/19	10:12 PM	Good night fellow participants, I have a bit of advice for allyuh, be very careful accepting invitements to events. I here sitting down at a BBQ, believe that igrance, now, lawd have mercy on muh, first thing, dum ask me the operate the BBQ grill, wuh loss, God is merciful, and uh get dey to late, so some body else was doing it when I get dey, but the smell of the BBQ fowl, and the grill water animal, (can't say the word, um killing muh) and yuh know wuh mek tings worse, it is Saturday,the fasting day can't remember de las time uh was such hungry. Lord geh muh strengt
5/18/19	10:15 PM	<anon>.... <anon>.....I sympathize with u
5/18/19	10:15 PM	I can feel ur pain
5/18/19	10:15 PM	🥺🥺🥺🥺🥺🥺poor fella I feel fa ya
5/18/19	10:16 PM	<anon>right now u fell like...just a little piece..🥺🥺🥺🥺🥺🥺🥺🥺🥺
5/20/19	3:57 PM	Getting to use to this ting, people are complaining that they don't like me new size
5/20/19	4:25 PM	Its not what ppl say is for your own health and good dont bother bout ppl they cant live your life for u
5/20/19	4:26 PM	Ya cant please ppl ya get big they complain ya get small they still complain
5/25/19	8:20 AM	When my mother was alive, she would say" <anon>, don't let me find out that you do it, come an tell me, because it's I find out boy, may the Lord help you,so people I'm telling you,I was bad this week,no it wasn't corn pone, I had a pack of nuts, 1 chicken wing,a vegetarian rotie and a donut all in this week
5/25/19	8:25 AM	<anon>...ur conscience really really had u though...
5/25/19	8:14 PM	Only if u will come and do the laundry am doingsow the skirt am about to sow...and prepare the lamb I have to prepare...and cook my corn soup
5/27/19	6:00 AM	<anon>....how are you this MN?...hoping you ate feeling better.....I pray God will continue to touch you.... spiritual...mentally and physically.....🙏
5/27/19	6:42 AM	Whenever you try to do something good the enemy always want to step but I declare this morning no weapon form against us shall prosper....
6/9/19	7:28 PM	Whoop whoop, life change
6/14/19	1:46 PM	My sister said to me this MN...don't go any further...don't loose anymoe weight
4/12/19	7:12 PM	Yes, yes Let the creative ideas flow.
4/13/19	12:05 PM	👏👏👏👏👏great to see such positive discussion and comaraderie. I can see some persons have gone ahead and started, thats great! I like your enthusiasm! We are here to support each other.
4/14/19	6:47 AM	Hallelujah....yes <anon>...when we look back 3 months from now...we will give testimony to that..In Jesus Name..
4/14/19	2:12 PM	Whoop whoop
4/14/19	2:12 PM	U go girl..👏👏👏👏
4/14/19	4:55 PM	for me preparation was a hard thing..but I am devoted to giving this my best..

4/14/19	5:20 PM	That's right u go ma girl
4/15/19	7:54 AM	Whoop whoop
4/15/19	8:06 AM	You also, be strong and know that we all will make it together
4/15/19	12:24 PM	I like it, You guys are really ready
4/15/19	2:19 PM	<anon> 🍌🍌🍌
4/15/19	2:23 PM	Man yeah yuh
4/15/19	2:28 PM	Ya really out do ya self
4/15/19	2:59 PM	I love the rapport between <anon>and <anon>. Great encouragement. 🍌🍌🍌🍌🍌
4/15/19	9:48 PM	Is it <anon>? I check with her today. She is coming along ok
4/16/19	9:57 AM	Ok.... understand...go <anon>..go <anon>..
4/16/19	11:14 AM	<anon>...that look sooo gd
4/16/19	4:32 PM	Skills coming out <anon>..
4/16/19	4:40 PM	🍌🍌🍌🍌🍌 ort <anon>
4/18/19	9:56 PM	Nice
4/18/19	9:56 PM	Very creative
4/19/19	2:58 PM	🍌🍌🍌🍌...go <anon>..go <anon>
4/19/19	2:58 PM	Yup that's my girl, I could count on you
4/19/19	6:43 PM	Girl, I don't know what to tell you, I know you'll be good though
4/21/19	2:56 PM	🍌🍌🍌🍌
4/21/19	4:33 PM	Hallelujah...you go <anon>
4/23/19	2:06 PM	🍌🍌🍌🍌🍌🍌🍌
4/23/19	2:11 PM	Lolll....go <anon>go..go <anon>go..
4/24/19	7:00 AM	🍌🍌🍌🍌🍌 yea...you did it...
4/26/19	11:22 AM	🍌 ready to eat <anon>...
4/26/19	11:22 AM	That looks so good, <anon>

5/3/19	9:27 PM	<p><anon>,just keep up the good work positive results are just around the corner for you as well as the other Participants remember that this regimen is a temporary"kick Start"to initiate weight loss and reeducate your taste buds during this12 week period.</p> <p>When you experience the visible results and other foods are introduced in the nutrition you will find it easier to stay on track as your taste buds change cravings will lessen,and your stomach would have adjusted to smaller amts.of food .</p> <p>In my experience,I found that is very necessary to have a positive mindset in order to succeed which involves keeping your eye on the goal and finding or returning to an activity/hobby that you really like especially one which include movement and exercise for me it was Line Dancing which I did several times weekly as it made me focus on something other than eating and remember it is Lifestyle Change that is your Goal and not sticking to a Diet it helps to think of Nutrition rather than Diet.</p> <p>Hopefully some thing will help someone on their road to success just stay on track.</p> <p><anon></p>
5/4/19	12:26 PM	Thanks <anon>...looks delicious... but I just had my soul and stir fry veg..😋
5/5/19	5:13 PM	Looks so good
5/5/19	9:31 PM	Stay strong <anon>
5/5/19	9:32 PM	<anon>..just focus in the prize...at the end.
5/7/19	7:53 AM	Gm all, Stay strong the Journey is worth it 🍌
5/7/19	7:52 PM	<anon>that looks real good...
5/8/19	6:51 AM	<anon>!!!! Get in there 🍌🍌🍌🍌 you set for the whole day
5/14/19	7:54 AM	U go fella
5/15/19	11:21 AM	It doesn't taste to bad sue
5/15/19	12:21 PM	Good haven't given you a spirit of fear, you can do this, want me to help you
5/16/19	5:45 AM	<anon>..u packing...
5/16/19	5:58 AM	So true <anon>have a great day all and be safe in the road
5/19/19	7:09 AM	Oh my <anon>you it through and still standing
5/20/19	3:06 PM	<p>Hey!! We are 6 weeks in and doing great 🍌🍌🍌</p> <p>I can have a 1 on 1 with each of you on Wednesday or Sunday to discuss your progress, and any thing else related to the study that you may want to discuss.</p> <p>C u sunday</p>
5/25/19	8:25 AM	Get back up and keep going
5/25/19	8:26 AM	We are almost there...
5/25/19	11:53 AM	Now that is out of your system you will be good to move on
5/25/19	8:23 PM	Be good <anon>I am rooting for you.
5/26/19	11:57 PM	Hi <anon>,was out this afternoon ,saw your posting not long ago and sure hope that you are better now ,I think your plans for investigation is very wise ,hopeing and praying you will be back to normal soon

5/27/19	9:04 AM	Oh, all the love in this group. I'm very encouraged by the camaraderie and the way you support each other. I'm also very encouraged by your results!!! I've been able to have a 1 on 1 with two of you and the looks on your faces when you saw your progress was priceless. I'm at church on Wednesday if anyone else wants a 1 on 1 then.
5/29/19	6:53 AM	Want to take the time to say Congrats to our Participants you guys are doing great
5/29/19	7:18 AM	Great Job ladies and gentleman keep up the good work 🍷🍷
5/29/19	7:58 AM	GM everyone wonderful pictures looking lovely people's great job well done 🍷🍷🍷🍷🍷🍷
5/29/19	10:03 AM	Gm all, great results. Looking forward to even greater results in the next 5 weeks.
5/29/19	12:51 PM	Congrats to everyone.... 🍷🍷🍷🍷
5/29/19	3:47 PM	Good afternoon wonderful pictures well done
5/31/19	9:30 PM	It is the end of another week again ,how time flies,I trust all is well with everyone ,looking forward to seeing you on Sunday AM. The photos are great and as the say a picture is worth a thousand words,those after shots are very encourageing indeed, <anon>this is for you you sure know how to spread joy even in challenging situations. I read with interest your plans for a study group and was reminded of the verse of scripture Third John verse two ;I think your plan seem to speak to spiritual health being exhibited at the same time that your physical health is improving it is Holistic and that was John's wish for. Gaius in that verse hope you will continue to be encouraged untill you reach your goal in all areas. This wish isextendedto all Participants
6/9/19	5:24 PM	We are near to the end if this Journey, we think we couldn't have done it, I sure you don't need the results to tell you that you're doing great I'm sure you can feel it and see it in your body. Very good Participants..
6/9/19	6:30 PM	No <anon>... thanks to you and the team..🍷🍷
6/9/19	7:27 PM	Thanks to <anon>first,for the introduction, thanks to all the advocates who were instrumental and committed to seeing us through, thanks to my princess <anon>for in her in way made the journey worth it, the thanks to all of the others. I'm now motivated to push more thanks a million
6/17/19	9:11 AM	Good morning to all, and to all a good morning. I'm wishing you all, all the best for the coming day and week
6/29/19	5:03 PM	Congrats to all Participants, as <anon>said it's a new beginning
4/10/19	9:34 PM	<Media omitted>
4/10/19	9:38 PM	<Media omitted>
4/12/19	7:05 PM	Its steamed zucchini, chinese cabbage, sweet peppers, radish drizzled basil and malt vinegar dressing. Infused with onions and garlic🍷
4/12/19	10:55 PM	<Media omitted>
4/13/19	10:31 AM	*Please be Reminded that you're coming church tomorrow for 8am and fasting starts from 10pm tonight*
4/13/19	10:41 AM	<Media omitted>
4/13/19	10:42 AM	Follow something like this it does not have to be exact just choose from the recipes
4/13/19	10:42 AM	I'm thinking, do everything as a salad,just change ingredients time to time, and the glucerna

4/13/19	10:43 AM	Probably blend a few smoothies
4/13/19	10:46 AM	Cucumber lettuce tomatoes and carrot
4/13/19	10:47 AM	And a 1/2 cup of ..eg..Roasted carrots and beets..
4/13/19	10:48 AM	One cup of salad glucerna 2 hrs after or 2 and a half so you won't feel hungry
4/13/19	10:48 AM	You can add some Spinach to that
4/13/19	10:49 AM	A measuring cup
4/13/19	10:49 AM	Note a cup is a cup
4/13/19	10:51 AM	<Media omitted>
4/13/19	10:56 AM	Any supermarket...or hardware
4/13/19	11:01 AM	Where I have juice in the morning...is where I would juice any if the combinations... From the allotted veggies
4/13/19	11:04 AM	And if u read the recepies...any thing dry...like salads is a cup...any thing in liquid form is 3/4 Cup
4/13/19	11:06 AM	Nooo
4/13/19	11:08 AM	Very
4/13/19	11:09 AM	<Media omitted>
4/13/19	11:34 AM	Carrot, cucumber, kale yum
4/13/19	12:13 PM	Both what you eat and how much you eat is important. You need to find a rhythm that suits you. The example i set out is what would work for me.
4/13/19	12:20 PM	<Media omitted>
4/13/19	12:28 PM	<Media omitted>
4/14/19	6:33 AM	<Media omitted>
4/14/19	1:09 PM	Doing the stir fry veg...and will use a roasted pepper along with that
4/14/19	1:41 PM	<Media omitted>
4/14/19	4:46 PM	Once you eat the right things 🍌🍌🍌🍌
4/14/19	5:49 PM	The prunes have sugar
4/14/19	7:12 PM	Easy on the green bananas <anon>, not part of the diet, but otherwise, really good
4/15/19	8:04 AM	No sweetener, beets does be sweet

4/15/19	11:56 AM	Gm everyone every one sounds good for breakfast this morning u I had some wheatabix with some diet green tea no sugar nor milk then about 10 am I had my glucerna
4/15/19	12:07 PM	No wheatabix
4/15/19	12:14 PM	Spagetti squash. A type of squash, not a type of pasta
4/15/19	12:22 PM	This is cucumber and carrot broccoli beets okra
4/15/19	12:57 PM	Ladies and gentleman. Remember to make a note of your daily intake for our reference
4/15/19	12:59 PM	Apparently we should be noting what we consume daily
4/15/19	3:21 PM	Yes, the first 5 days are the toughest, so its quite normal to feel absolutely starving. Hang in there
4/15/19	3:31 PM	8oz
4/15/19	7:22 PM	<Media omitted>
4/15/19	7:55 PM	<Media omitted>
4/16/19	9:33 AM	Happy bday <anon>. 🥬🥦. Broccoli cake and lettuce juice lol
4/16/19	11:09 AM	<Media omitted>
4/16/19	11:35 AM	This what I had yesterday afternoon steam veg broccoli, carrots, squash,kile.beets with a salad red onion cucumber sweet pepper parley
4/16/19	4:31 PM	<Media omitted>
4/16/19	4:55 PM	No channa peas. No granburger. You all real pushing this thing though. Broccoli abd lettuce. 🥬🥦🥒😂😂 Lol😂
4/16/19	4:59 PM	<Media omitted>
4/16/19	4:59 PM	Sugar snap peas. Low starch, high fibre
4/17/19	8:53 PM	Yes please.
4/17/19	8:55 PM	That would go good with pumpkin / squash
4/18/19	7:05 AM	<Media omitted>
4/18/19	3:43 PM	Carrots, beets, Chinese cabbage, lettuce, tomatoes, cucumber and sardines, made into a 🥗, that's lunch
4/18/19	9:55 PM	Mushroom, eggplant, zucchini and cauliflower seasoned with paprika, white pepper, salt and hot pepper.Blended in the nutrabullet.
4/19/19	2:59 PM	I made my corn soup last night.(In my own way).. I try to do ahead ...so I won't have to come home and wait
4/21/19	5:15 PM	We are not suppose to...unless you were doing it before the program started..
4/23/19	12:32 PM	Today I had my ginger water....shake...then plain water...when get back to work..am having... salad... corn soup....shake a bit later...

4/23/19	2:26 PM	<Media omitted>
4/23/19	7:26 PM	What do you think? <Media omitted>
4/25/19	8:25 AM	<p>A very good morning to all , <anon>how are you doing? I pray that you will be upheld by God's strength at this time.</p> <p><anon>,here is a tip for you after seeing one of your previous messages,you will find it helpful if you include a fibrierous vegetable in your selection of vegetables which will take longer to digest and so keep you Fuller longer. examples of very fibrierous types Incude Celery chopeg in 1 to 2 inch pieces ,Okchros ,red ,white or green Cabbage can be had steamed lightly with a slice or two of Onion and or Margaom for flavour ,orcan be chopped medium fine strips raw to make a Slaw ,Carrots and white or red onion slices can be added</p> <p>Thanks</p> <p>The Celery can be added to any salad of your choice raw and finely chopped</p> <p>You can select from the above and have in addition to other softer types Veg's. from the approved list but you must keep to the 1cup in total per meal recommended eg not more than 4 cups per day</p> <p>Perhaps other participants may also find the above helpful.</p>
4/25/19	2:44 PM	<Media omitted>
4/25/19	4:03 PM	<Media omitted>
4/25/19	4:52 PM	<Media omitted>
4/25/19	11:44 PM	All sounds good. Remember, portion size (how much you eat) is as important as content (what u eat)
4/26/19	10:01 AM	<Media omitted>
4/26/19	11:17 AM	<Media omitted>
4/26/19	11:57 AM	<Media omitted>
4/26/19	11:57 AM	<Media omitted>
4/26/19	12:00 PM	<Media omitted>
4/26/19	2:03 PM	Leeks are a type of onion. Thick stalk with a large onion at the end
4/26/19	2:15 PM	<p>Hi, <anon>,I think it is you making the enquiry regarding the leek which was included in the variety of vegetables; I get them from <anon>or <anon>supermarket occasionally it is like an added treat for me to spice things up a bit when they are available at the right price.</p> <p>They are Avery old veg. which believe it or not is mentioned as early as in the Bible and I believe that they belong to the onion family.</p> <p>It is made up of two parts and is elongated in shape with the lower part white and onionlike in appearance and the upper end green with thick leaves held closely together uprightly so that they vary insize from aprox.2 to 5 inches in circumference and 10 to maybe 18 inches long and are always individually wrapped and priced.</p> <p>I always select one for around 2 to \$3 one of the smaller onss taking care to get one thati is not withered at the top.it is all edible both portions and I have always sauteed or and or used small AMT. Of coconut oil or Olive oil as only amild heat is needed for a short time together with seasonings of choice.</p> <p>Hope this helps</p>
4/27/19	4:20 PM	Remember fasting from 10pm tonight. See ya'll tomorrow
4/28/19	12:42 PM	No <anon>
4/28/19	2:08 PM	Yes <anon>..no bread fruit

4/28/19	6:50 PM	Tomorrow morning we walking from <anon>up <anon>Hill, cross <anon>, onto <anon>hill, down <anon>hill, up <anon> to <anon>. be there for 5.30. walk starts at 6. <anon>annual walk.
4/29/19	10:33 AM	I do something just now and it ain't taste to bad, I blended beets, carrots, ginger and 🌿
4/29/19	12:47 PM	And will come faster if we add exercise to the program
4/29/19	1:04 PM	If u put a cup of salad with the stirfry..that is two meals
4/29/19	1:17 PM	Probably...roasted okras....or kale chips or something
4/29/19	2:36 PM	<p>Looks good,keep it up and you will soon experience increased metabolism resulting in weight loss with a normaliseing of the blood sugar and all other significant Numbers relavant to the reversal we are working towards. It worked for me.</p> <p>Here.isa tip for preventing wasting that I wished I knew earlier re.in the event you have more of any vegetables in excess of what you want to use immediatly or say within 2 days or so.</p> <ol style="list-style-type: none"> 1. Wash and chop the peeled vegetable/s according to their kind. 2. If you are using salt,add 1/4 to1/2 teasp. salt in medium sized saucepan and place acollapseable steamer in the pot the water should be just about 1 to1 1/2 inches above the bottom of the steamer(that is one to two inches). 3 Bring the water to the boil,add the vegetables ,when it boils add the veg.and leave,I really mean watch for two mins only .;this method is "blanching",you don't want to cook them at this point this method is a preserving tactic only and allows you to do whatever you want with them in the future . 5. Remove from the heat and cool,if you accidently left them on the stove alittle longer than the two mins.then take them under the tap,pour out the boiled water from the pot and run cold water over the veg.to stop the cooking process,or you may like to save the boiled water in which the veg was cooked in and use it in a soup another time perhaps, 6. Finally,store the cooled ,blanched vegetables in containers you can use strips of wax paper or parchment paper to separate portion sizes and freeze for future use. <p>If you separate the portins in the container this makes defrosting all in the container and to be able to lift out only as much as you need at any time. This last bit I found out myself .</p> <p>The veg can now be used as any frozen veg which you may buy in the Suppermarket provided you did not overcook them in the first place if you did ,you would then just warm them and use as wished</p> <p>PS. We loose the Nutrients if we overcook our vegetables the shuould always be lightly cooked only.</p> <p>I am sure that there will be some or most of you who will already be familiar with all the above but if it can help one person then that is fine by me. Oh by the way they keep for a very long time frozen.</p> <p><anon></p>
4/29/19	3:16 PM	<anon>the measuring cup is about three cups not one
5/1/19	8:19 AM	I've been up long time. Forked up a bed and planted some beans. Maybe we should have a gardening competition, will help.with the food bill as well. Short term crops like beans and okras
5/3/19	12:01 PM	Our version of philippians 4:8, finally participants, whatsoever things are good, whatsoever things are healthy, whatsoever things are none fattening, whatsoever things are organic, if there be any vegetables or if there be any glucerna, eat of these things
5/4/19	10:46 AM	<Media omitted>
5/4/19	11:58 AM	<Media omitted>
5/4/19	12:24 PM	<Media omitted>
5/5/19	4:38 PM	<Media omitted>
5/5/19	8:33 PM	Stirfry, 🌶️,okra, Christophine, red cabbage, sweet potato, spinach, Chinese cabbage corn,I think that's it

5/5/19	9:13 PM	No potatoes in any form
5/5/19	9:24 PM	No peas please
5/6/19	12:41 PM	<Media omitted>
5/7/19	6:06 PM	<Media omitted>
5/7/19	6:06 PM	From the other group. Strawberry glucerna, beets, carrots and cinnamon. Looks pretty
5/7/19	7:23 PM	<Media omitted>
5/7/19	7:23 PM	My cauliflower rice with carrots peppers and cabbage
5/7/19	8:44 PM	Good question. Yes, as long as you only have 1 cup
5/8/19	1:09 PM	<Media omitted>
5/11/19	7:08 PM	Hey guys, remember fasting from 10pm. C u tomorrow
5/14/19	7:45 AM	Ammmm, stew veggies for breakfast, glucerna beets and carrots shake for break, soup for lunch, glucerna beets and carrots shake for break and glucerna for dinner
5/16/19	5:43 AM	Glucerna pumpkin and carrots, stirfry veg and a salad, food for the day.
5/17/19	7:49 AM	🥕 and 🥕 soup, glucerna <anon>and 🥕, these glucerna mixes could kinda grow on yuh
5/20/19	3:30 PM	You shouldve written to us BEFORE you eat the corn pone. We couldve enacted some preventative measures with some corn soup or something. Never mind. You rally long. And you are doing quite well
5/21/19	7:57 AM	Eggplant, carrots, beets, Christophine, celery, pumpkin and okra stew in a brown down sauce, ask me mom, she use to do it with chicken feet and necks. This is breakfast.
5/21/19	8:02 AM	🥕, cucumber, grated carrots, ginger, garlic, beets, sea salt and lettuce, lunch people.
5/21/19	8:36 AM	I see you are having pumpkin and beets together. Although low starch, they both have moderate sugar indices and you should probably separate them. Maybe Sis <anon> can give us a class on this one of these days
5/25/19	8:03 PM	GN all, remember fasting from 10pm
5/26/19	1:37 PM	Corn and cabbage..
6/1/19	10:55 AM	<Media omitted>
6/1/19	10:55 AM	Pickle mushrooms. Taste like the othet pickle thing
6/5/19	7:55 PM	<Media omitted>
6/5/19	8:29 PM	Cucumber stew

6/6/19	7:46 PM	<p>Cauliflower rice & Mushroom stew</p> <p>1 whole cauliflower 1 medium size carrot 1/2 head broccoli 1/2 stem kale</p> <p>1 small tin mushrooms 2 cups vegetable stock 1 medium onion 2 garlic cloves minced 1/4 tsp ginger 1/4 tsp cinnamon 1/2 tsp sage 1/2 tsp coriander Salt to taste Thyme, marjoram, rosemary, parsley hot peppers(optional) basil, cummin, Italian herbs seasoning(wet) 1/4 cup balsamic vinegar Green red yellow orange peppers(bell)</p> <p>Cut cauliflower and broccoli into chunks just using the head grate carrot. Chop kale. Steam the cauliflower in medium saucepan. Gradually add carrots and the broccoli and kale. Cook time 7mins.</p> <p>Season mushrooms with the spices and let stand for 5-10mins In a small saucepan (using olive oil spray, very little) stir in mixture. Continue stirring for a few mins, add a little water and keep stirring. Add veg stock. Let cook for 10mins.</p> <p>Strain off water from cauliflower mixture take out cauliflower and using a fork, mash cauliflower(but not to a paste) until it crumbles into a rice-like form. Add carrots, kale and broccoli into the rice. Then serve</p>
6/14/19	8:03 PM	<p>Just being very clear in terms of the diet for those now joining us.....</p> <p>In 24 hours are allowed</p> <ul style="list-style-type: none"> - 4 glucernas -4 servings of non starchy vegetables -all the water you can drink <p>One serving of vegetables is 1 - 235 ml cup of uncooked/raw vegetables OR 1/2 of a cup of cooked vegetables</p>
6/14/19	8:03 PM	Here are a few pics of metals prepped by us in the last few weeks
6/14/19	8:03 PM	Garlic ginger broccoli with eggplant and peppers
6/14/19	8:03 PM	Cucumber boats with spinach,onion,celery,tomato and lemon pepper.
6/14/19	8:03 PM	Pretty prep for stir fry
6/14/19	8:03 PM	Et voila
6/14/19	8:03 PM	Shake with beets,carrots,cinnamon and strawberry Glucerna.
6/14/19	8:03 PM	Cauliflower rice stir fry
6/14/19	8:03 PM	Fried okra, Onions, spinach,garlic,lemon pepper,tomato,w/sauce.
6/14/19	8:03 PM	Roasted beets plated in style
6/14/19	8:03 PM	Pumpkin soup.I believe

6/14/19	8:03 PM	My Mother's Day lunch. Cauliflower Rice 🍴🍴
6/14/19	8:03 PM	Beets, spinach n sweet peppers I think

BDRS WHATSAPP GROUP WORKSHOP PARTICIPANT CONSENT SHEET

I can confirm that (please tick as appropriate):

- I have been given the opportunity to ask questions about the project and my participation in it. All questions have been answered fully to my satisfaction.
- I understand the workshop will be audio recorded.
- I understand that results from the workshop will be used to improve the design of peer support tools for the Barbados Diabetes Reversal Study.
- I understand that anonymised information (without names) may be used as part of the writing of this research in academic publications and reports.
- I understand I can choose not to take part at any time without giving reasons and that I will not be penalised for this.
- I understand that my personal information will be treated as strictly confidential and handled in accordance with the provisions of the Data Protection Act 1998 and GDPR.
- I understand that other researchers who are part of this project can access the data providing they agree to preserve the confidentiality as specified in this form.
- I voluntarily agree to my participation

Participant's Statement:

I _____ agree that the research project has been explained to me to my satisfaction and I agree to take part in the study.

Signed:

Date:

If you wish to contact the researcher, please use the details provided below:

Dan Howard

Open Lab, Newcastle University, UK
d.howard2@newcastle.ac.uk

Emma Simpson

Open Lab, Newcastle University, UK

Appendix C.6 Sentiment Cards used in Evaluation Workshop

**There were
too many
messages**

**I always
had time to
check the
group**

**There were
not enough
people in
the group**

**The
messages
were too
long**

**I had to make
a deliberate
effort to
check the
group**

**The
notifications
from the
group were
distracting**

**I have used
WhatsApp
more than I
used to**

**I was happy
to share
personal
information**

**I didn't want
to share times
when I had
found the diet
difficult**

I didn't want to burden anyone with my posts

I messaged mostly before I had experienced a challenging time on the diet

I messaged mostly after I had experienced a challenging time on the diet

Conversation in the group felt natural

I spoke differently in this group than in other WhatsApp groups

I felt that I should reply, even when I didn't want to

I feel like others in the group genuinely wanted to support me

I had support elsewhere so didn't need the group

The group blended into my everyday life

**It is strange
to use
WhatsApp
in this way**

**The group
was a
distraction
for me**

**I don't see
the point in
the group**

Appendix D Social Media Language Learning Supplementary Material

Appendix D.1 Social Media Language Learning Workshop Consent Forms



LANGUAGE LEARNING DESIGN WORKSHOP

PARTICIPANT CONSENT SHEET

I can confirm that (please tick as appropriate):

- I have been given the opportunity to ask questions about the project and my participation in it. All questions have been answered fully to my satisfaction.
- I understand the workshop will be audio recorded.
- I understand that results from the workshop will be used to help design a digital support tool to support language learning.
- I understand that anonymised information may be used as part of the writing of this research in academic publications and reports.
- I understand I can choose not to take part at any time without giving reasons and that I will not be penalised for this.
- I understand that my personal information will be treated as strictly confidential and handled in accordance with the provisions of the Data Protection Act 1998.
- I understand that other researchers who are part of this project can access the data providing they agree to preserve the confidentiality as specified in this form.
- I voluntarily agree to my participation

Participant's Statement:

I _____ agree that the research project has been explained to me to my satisfaction and I agree to take part in the study.

Signed:

Date:

If you wish to contact the researchers, please use the details provided below:

Dan Howard
Open Lab, Newcastle University, UK
d.howard2@newcastle.ac.uk

Ahmed Kharrufa
Open Lab, Newcastle University, UK

LANGUAGE TEACHING DESIGN WORKSHOP

PARTICIPANT CONSENT SHEET

I can confirm that (please tick as appropriate):

- I have been given the opportunity to ask questions about the project and my participation in it. All questions have been answered fully to my satisfaction.
- I understand the workshop will be audio recorded.
- I understand that results from the workshop will be used to help design a digital support tool to support language learning.
- I understand that anonymised information may be used as part of the writing of this research in academic publications and reports.
- I understand I can choose not to take part at any time without giving reasons and that I will not be penalised for this.
- I understand that my personal information will be treated as strictly confidential and handled in accordance with the provisions of the Data Protection Act 1998.
- I understand that other researchers who are part of this project can access the data providing they agree to preserve the confidentiality as specified in this form.
- I voluntarily agree to my participation

Participant's Statement:

I _____ agree that the research project has been explained to me to my satisfaction and I agree to take part in the study.

Signed:

Date:

If you wish to contact the researchers, please use the details provided below:

Dan Howard

Open Lab, Newcastle University, UK
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Ahmed Kharrufa

Open Lab, Newcastle University, UK

Appendix D.2 Sample Transcript from Language Learning Workshop Discussion

...

Cause there are certain apps that are based, or at least a certain group of people would use when they are learning a certain language. Like, KaKao is generally for like people of Korean descent, and...

Like Line

... WeChat that's [Inaudible]... So, unless you have an "in" into those systems, there's no point having those apps if you don't know anyone you could connect with.

Or you just wouldn't have heard of them.

Exactly. You wouldn't know that they existed must less like...

[Indistinct Chatter]

But you could still [Inaudible]... and just know someone who [Inaudible]... Cause I've had a, like I think if you spend, I think that's more about like the time spent in the country learning the culture. Because you can be relatively sh*t at a language but have people who use that thing so you kind of like hold on to the app [Inaudible]...

Yeah, but I think also until you have a certain knowledge of that language, you're not going to be texting in Chinese, Japanese, Korean...

Competence's essential for direct messaging...

Yeah!

[Indistinct Chatter]

"Hello", "Dog", "Cat", "Five", that's not really going to be helpful...

[Indistinct Chatter]

[Inaudible] ... most accessible out of all of those... [Inaudible]... engaging another person?

Probably not WeChat.

[Laughter, Indistinct Chatter]

If you want to engage with another person...

WeChat's like sink or swim though. It's like you have no choice because your VPN isn't working so you don't really have...

Yeah, that's very true.

... no other choice.

[Indistinct Chatter]

KaKao's pretty good. KaKao and Line are very similar. So I don't really know where to, I don't think there is a... yeah...

What, what, what makes them more accessible than another one, you think?

Cause I think it's cause they're kind of like they've got the...

So many pictures! What're those things?

Stickers.

Yeah.

So you instantly got this visual recognition(sic) that, "oh that's the KaKao character" or "that's the Line character". Like they've got their little groups of characters, and they're quite... they're just very simple, most can use...

People use more stickers than you would in English. Like, let's say you were following a Facebook group...

[Indistinct Chatter, Laughter]

... KaKaoTalk and Line, I feel like people use more stickers. And like guys use a lot more stickers.

[Indistinct Chatter]

There are like stickers on Facebook Messenger...

And there are ones you can buy.

[Indistinct, Indistinct Chatter]

They are like moving emojis? I mean, I can show you. I'll show you a sticker on Line.

Just to bring everyone back so that we are all talking as one rather than as separate groups. Originally we were talking about people using stickers and all that, and so, so the general question would be: Is that a cultural thing or is that a "learning language" thing?

I think it might be a cultural thing right? Because Facebook did try coming up with stickers and it didn't quite pick up.

Yeah, if you don't understand... I mean there's so many...

[Indistinct Chatter]

Well, I read one recently about Japanese girls with stickers and language learning, like it's definitely a, there are, there are (in the background "but even Japanese guys") cultural aspects...

No, but I think it's probably because, like, you associate certain images with certain, like for Japanese you tend to think anime right, and then there are certain expressions that an anime character will do which would tend to relate a certain sort of emotion that you want to, like, pass on, whereas it's not as common in an English medium for those kind of like image... So I guess the closest thing to a sticker for an English medium would be memes right?

Yes.

Or gifs.

Certain thing which is...

I would say gifs.

Gifs.

Yeah.

So is it fair to say that although the use of them is generally a cultural thing, the unexpected bonus of that is that it makes conversation for a beginner of that language quite friendly and accessible with the images?

Yes.

Sure.

I would definitely agree with that. If you can't quite think of how to respond, you could just put a sticker.

Yeah. You just...

If I don't understand what's just been said to me, I'll just...

[Laughter, Indistinct Chatter]

That's just real life for me, just smile if you don't know what's going on.

[Laughter continues]

And then there can still [Inaudible]... the conversation can continue on and you're not always having to go, like, "sorry, what was that?", or like, "can you say that in a different way?".

Yeah.

Whether that, that makes it easier, whether that means your language gets better or not is completely...

Exactly.

[Mixed Chatter, In Agreement]

The actual learning.

A [Inaudible] can be an interruption.

[Mixed Chatter, In Agreement]

Yeah, yeah.

Cause if you just have like two lines and then you walked out then that will, like, improve your language less than umm...

So it helps with communication but not necessarily with learning.

It probably lacks rigour, I suppose, none of these things.

Like, it's more like an immersion than, like, structured learning.

Yeah.

Alright, brilliant. So this last group then. What do you think is the most surprising thing on your board?

We said it was that one.

So you need another one then.

[Laughter, Indistinct Chatter]

Umm... oh no, you have yours real high.

Higher.

Well, it's okay. Maybe we have exhausted all of the surprises. Let's talk about these then. So that's quite similar. Is it the same with you guys as well? You've got, where's your Feeds, the... [Inaudible] (it's quite low on our...)... ah right. Okay, so we've got a little difference there then. So let's talk about that... *So you guys, Feeds umm, use quite a lot?

*Yeah, we put the, we use Facebook and Instagram more but we know them in real life, whereas Asha is...

I am the only Twitter user...

Yeah, but I absolutely follow Japanese speakers on Twitter, so that I get Japanese on my Feed that I can read [Inaudible].

And is that a familiar thing for this group [Inaudible]?

Well, I use Facebook, so the Feeds I think of is Facebook Feeds which is something that... wait, do you see other people, random people's, like, Feeds on Twitter or do you...?

On Twitter, I follow people I don't know.

Follow.

Ah, okay. So there's an option of like knowing random people's [Inaudible]. So on Facebook, you only get friends', so if they speak a different language, you get it, and then there is that, an option to translate what they're saying... which helps.

Awful translation...

I know, I know. Sometimes it's funny.

Yeah.

The translations are just ridiculous.

What do you use for that? *Automate translate or Google translate or... ?

I don't know. It's just an option... Yeah, there's just an option on... Yeah. I don't know what they...

Sometimes I've had people write in English and then they try to translate it...

[Laughter]

Yeah, it doesn't make any sense at all.

It just was so incomprehensible in English [Inaudible].

So would you say it's quite limited if somebody is trying to learn a new language?

I mean, you would have to know people who, well no, if you're using Twitter, like, you do, then you can use it for learning other things right? But generally with things like Facebook or

Instagram Feeds, again, it's maybe for the more advanced learner because you would have to know some people to be able to follow their stuff and...

I think following celebrities on Instagram is quite common though isn't it?

Oh, yeah!

Chinese celebrities (Taiwanese...), oh well, China's blocked so but like...

Taiwanese?

Taiwanese, yeah.

Hmm, the by-pass.

Or Korean.

Taiwanese!

[Laughter]

All the celebrities...

Yeah.

Alright, brilliant guys. Thank you so much for that. That was actually super useful. So I think we'll probably take.

Appendix E Unplatformed Design Model Case Study Analysis Process

