

# Problem Based Learning: Developing competency in knowledge integration in health design

Katherine Sellen, OCAD University, Canada

## Abstract

Different communities, organizations, and people hold different views on their own and others' wellbeing. It is often challenging to balance different perspectives during the design process when the truth of medicine is competing with the truth of social media and the everyday experience of wellbeing of patients, caregivers, family and friends. In the context of the Masters of Health Design at OCAD University (OCAD U), we develop students' competency in working with truth through challenging students to engage with multiple 'truths' in the design process, engaging deliberately in identifying and working with multiple truth regimes as part of a problem based learning approach. This includes how truth regimes impact the understanding of a challenge area, techniques for engaging with stakeholders, communicating and developing concepts, and the process of seeking and working with feedback for refining and iterating, and finally in communicating project solutions. By engaging in problem based learning, students are exposed to the real challenges of different stakeholder perspectives and in particular how different truth regimes serve to impact what counts as legitimate knowledge and legitimate knowledge representation.

## Key words

*health design, knowledge, process, problem based learning, stakeholder engagement*

## 1 Introduction

While design practitioners may enjoy the legitimacy to practice in a range of domains, this is often not the case in medical or health related settings where knowledge arising from the practice of design may be an unfamiliar process. As well, knowledge arising from design practice may be perceived as in competition or opposition to established forms of knowledge and knowledge production, such as the evidence base of bio-medicine, humanistic medicine, or the patient experience (Sellen, 2017). In thinking about different types of knowledge production and maintenance one might describe these as differences in style or regime – a truth regime. In the health sector, it could be said that there are several styles of truth regime commonly in operation that a designer working in the health

domain might encounter and be challenged to work with, perhaps integrating these as part of the design process. As a student of health design, one of the competencies that is integral for success, is the ability to navigate and integrate truth regimes in the often-contested space of healthcare.

At first glance, the scientific truth of medicine and its evidence base would seem likely to dominate. This is the first challenge for students. In the first stages of understanding a project or challenge area, identification and interpretation of scientific sources of knowledge may be an unfamiliar activity for many students and may need to be supported through technique development in seeking and synthesizing medically related evidence for design. However, the role of the 'doctor' or physician can be a particular and dominant one, and may signal that the role of clinicians in a design related project can involve negotiation by the designer in, or with, a truth regime that is not based on evidence but on a humanistic approach. In the course of the M. Des. in Design for Health at OCAD U we support students to develop competency in integrating knowledge from different truth regimes as part of their learning process, recognizing also that design for health students themselves operates within their own truth regime, one that may privilege designer, process, prototype and designed object. With this paper, the intent is not to revisit conversations on design and science, discipline and practice (Cross, 2007), but to share the experience of a developing framework that prompts further thought on these topics in the context of design for health.

### 1.1 The truth regime

A truth regime can be described as a general politics of truth (Weir, 2008) comprising of: ways in which truth is identified and represented; techniques that indicate true or false statements; techniques for how statements are evaluated/or not as truthful; and the status accorded to those that speak 'truth', and, the manner in which truth is 'spoken'. The concept of the truth regime was discussed by Foucault in 1960s and 70s alongside ideas about knowledge and power, and in particular in reference to scientific and quasi-scientific truth in modernity (Foucault, 2000). Analyses of the concept of the truth regime and the implications of this idea for design are rare and even rarer in medicine or health. However, a few examples of its use to interpret biomedicine and the experience of health and wellbeing do exist (Larsson, 2013; Valverde, 2002). The ideas described in this paper, for instance, are drawn from the work of Lorna Weir (2008). Weir provides an interpretation of Foucault that highlights different types of truth regimes in addition to scientific and quasi-scientific truth – these form the basis of the design for health framework used in the context of graduate training in health design. Developing this work for relevancy to the health context and to design practice, the framework also draws on the work of Sam Ladner (Ladner, 2014) who uses Weir's work to advocate for the use of the truth regime concept in the practice of ethnography in the private sector. Both Weir and Ladner emphasize several types of truth regime that identify, represent, and present truth in different ways. A summary of four key styles of truth regime according to Weir (2008) and Ladner (2014) are as follows:

- Veridical truth – scientific truth based on the constant search both for error and new data
- Governmental truth – principally concerned with governing behavior and quasi-scientific
- Symbolic truth – represents truth through ritual and role, rendering invisible truth visible
- Mundane truth- truth that arises from everyday experience, common sense or common knowledge

While these truth regimes may be operating in any domain, they are present in prominent ways in the health sector. In this paper, a framework for understanding and working with these different kinds of truth will be shared - including how it has been used as a graduate learning tool, applied to knowledge integration in the re-design of a geriatric psychology unit during a problem based learning engagement for Design for Health master's students at OCAD U.

## 1.2 Problem Based Learning in Health Design

Students of health design are supported in their exploration and mastery of knowledge integration in design for health contexts through problem based learning and the progressive development of design technique and critical thinking skills. The curriculum of the M.Des. in Design for Health at OCAD U is organized into a series of four problem based learning engagements, which are developed and executed with health sector partners. Projects are supported through embedded activities with these health sector partners as well as studio based learning supported by an interdisciplinary group of faculty members. The first two problem based learning engagements are supported by seminar based learning and it's in the context of these supporting seminars that key concepts from medical anthropology are introduced, the social science and critical sociology of biomedicine, and the concept of the truth regime. The supporting seminar structure provides an opportunity to explore and discuss the development and role of different design approaches and traditions. This includes the more veridical or scientific approaches of engineering, user centered design and usability, to the critical design and conceptual design approaches that are perhaps more symbolic, and the inclusion of co-design and participatory design techniques that that may support the mundane or everyday truth of participants. Students, at the same time, respond to the problem based learning engagement, choosing what design approach to take, how to organize their involvement with stakeholders, and how and what to research and prioritize in the design process.

## 1.3 Problem Based Learning – Geriatric Psychology Unit Re-Design

In the case of the geriatric psychology unit, the students were presented with a problem based learning engagement with a local rehabilitation center. The stakeholders presented the students with the purpose of the engagement – to develop a redesign of the unit within the constraints of its existing footprint and with special consideration for the particular needs of the patient population that it serves. One of the first steps for students was to try to understand what the unit's purpose is, and what types of patients the unit serves. With this first step in a project, students are engaging with different truth regimes.

How is the patient population defined? In medical terms? Or, in terms understood by nurses and clinicians on the unit, by family and friends, or the long-term care homes where many of the patients arrive from? Are they “Dr ...’s” patients? Or are they defined by their behavior – which places them in the unit as a result of governmental forms of truth about their suitability/or not for a long-term care place? Students are challenged to explore the possibility that different truths about the unit and its patients, as well as its staff, family and friends, may be at play. In this way students learn from the challenge of negotiating different truths and the viability of different outcomes in terms of a design solution – a key aspect of problem based learning (Savery & Duffy, 1995). It may be appropriate to decide to take a participatory approach in such a situation, as participatory techniques are intended to support multiple stakeholders and the politics of different positions (Robertson & Wagner 2012), but similarly, an evidenced based approach in which students interrogate the evidence base for data on dementia, behavior, and designed elements such as lighting, artwork, flooring, furniture and activities, may also be appropriate – in considering these decisions as part of the learning process. Students are asked to develop a rationale for their choices that demonstrate an awareness of different truth regimes, indeed a rationale and plan that makes use of different truth regimes in integrating knowledge to inform design.

## 2 Truth regimes in health

Layering onto the choice of the design approach, it is useful for students to understand how truth regimes operate in the health context – for instance with the physician or clinician there may be ritual and ritualized objects (for example the stethoscope), codified roles, and the storytelling (humanistic medicine) that reinforces certain beliefs and structures. What is key here is that perhaps unexpectedly this symbolic form of truth can be in conflict with bio-medicine or scientific evidenced based approaches (Mykhalovskiy & Lorna, 2004). Contrast this with the everyday truth of the patient – their experience of their wellbeing informing their beliefs and understanding of their situation and needs that arises out of continuous personal experience. Figure 1, illustrates four types of truth – mundane truth (here characterized as “life” to refer to the lived experience), symbolic truth, governmental, and scientific truth, with reference to the concept of wellbeing. In this brief exploration of the concept of wellbeing we see several aspects of what Foucault describes as the “truth game”<sup>4</sup>, namely different roles or figures that are able to “speak the truth”, and specific reference points for each type of truth – for example the evidence or procedure of science as a reference point for scientific truth. When we consider this representation, it illustrates how certain types of truth regime may be in conflict with each other and how some may be more open to change than others.

<b>Life</b>	<b>Symbolic</b>	<b>Governmental</b>	<b>Scientific</b>
<b>“The mundane everyday experience of health.”</b>	<b>“What our leaders tell us about health.”</b>	<b>“Eligibility of the patient – category, behavior.”</b>	<b>“The science of health – concepts, experiments, and data.”</b>
<b>Anyone</b>	<b>Only specific figures</b>	<b>Administrator or Holder of policy</b>	<b>Scientists</b>
<b>Self-evident</b>	<b>Legitimate story</b>	<b>Policy and Procedure</b>	<b>The evidence</b>
<b>Truth vs Lie</b>	<b>Ritual</b>		<b>Procedure</b>

**Figure 1. Four Truth Regimes in Relation to Wellbeing**

## 2.1 Scientific Truth in Health Design

In scientific truth, there is always the possibility for new evidence, new data or ways of measuring that allow for a change in direction. In relation to the dementia patients in the geriatric psychology unit, there is new science on dementia every day. In terms of a design approach working with scientific truth, students are encouraged to develop skills in working with the evidence base, interpreting scientific data and synthesizing evidence. Part of this process of building competency also includes a critical understanding of the development of evidence based medicine and the way in which evidence based approaches are used in the health sector to organize innovation and change. Models of healthcare intervention design are compared to design approaches to identify opportunities and challenges for integration. In the case of the geriatric psychology unit re-design, students developed evidenced based scoping reviews that demonstrated to their stakeholders that they respect and understand the scientific truth relevant to the unit. They then presented design concept scans that demonstrated how such scientific truth can be reflected in design choices and outcomes.

It is worth considering here if there is an equivalent to scientific truth in design? Evidence based design in healthcare is relatively well established, however, this is not what is intended by a scientific truth equivalent in design. Instead the truth regime concept can be used to challenge students to consider how design is represented in the evidence base – if at all. This draws attention to how invisible design work can be in a sector dominated by the randomized controlled trial, case study, and case note as the mechanism for knowledge representation. The equivalent for design may be design museum archives, prominent design magazines and blogs, perhaps even Instagram or Pinterest? What does a scientific approach to gathering and integrating knowledge from these sources involve? These and other questions become discussion points to challenge students to see how design insights might be expressed to stakeholders both through process and forms of knowledge representation. Out of this discussion come proposals for discovery phase

design work including a process of capturing and expressing design examples through forms of scientific truth production and representation such as mini-scoping reviews.

## 2.2 Mundane Truth in Health Design

The staff on the unit experience new patients on a regular basis, and patterns of behavior may emerge through everyday experience of the work of the unit. The staff may share a collective mundane truth about how the unit works, the type of patients on the unit, and how certain designed objects or spaces serve to support or not the work of the unit. A common response from staff would be “We know the bathroom needs redesigning” based on the everyday experience of the difficulties persuading patients on the unit to accept intimate care (a term that comes from the governmental truth regime operating in the health sector and a criterion for deciding if a patient remains eligible for home or long-term care). However, further probing and exploration of intimate care of older adults in care settings as well as some basic design ethnography revealed that the ‘problem of the bathroom’ starts well before the bathroom is experienced. This allowed a reframing of the problem away from the bathroom itself to the experience of undressing and preparing for bathing. As mundane knowledge is open to change through everyday experience, students were encouraged to use a mundane and everyday story telling technique to communicate this reframing to stakeholders. In this way, the mundane truth of staff is respected, acknowledged and built on by students.

In the case of the geriatric psychology unit there is a barrier to interact with patients due to the advanced level of cognitive decline, however, in many other problem based learning engagements, working with patients, family and caregivers would be expected. The practice of experience based co-design is a common approach now advocated in the health sector to specifically address the inclusion of patient experience (Bate & Robert, 2006). While there has been little attention paid to forms of mundane knowledge generally, the domain of health is the exception. Sociology and anthropology of health does seek to understand the relationship between biomedicine and lay knowledge/experience. Experienced based co-design has emerged as a counterpoint to evidence based approaches, with its emphasis on patient narratives, emotional touchpoints, and video based story telling. In the same way as students compare design approaches to evidenced based approaches, students are encouraged to compare and critique experience based co-design, and decide whether or not the techniques central to experienced based co-design will support the integration of mundane truth. One of the challenges for students in this regard is the number of other design based techniques that come from design approaches that also serve to represent mundane truth – personas and scenarios, for instance.

## 2.3 Symbolic Truth in Health Design

Symbolic truth manifests truths that are thought to exist but are not visible, and this manifestation is often conducted in particular ways that often include ritual and storytelling. Authorized speakers of symbolic truth are usually power holders, for example the nurse practice leader, the surgeon, or representative of a clinical specialty, can be counterweights to those in power or those in dominant positions, for example, patient advocates, representatives with lived experience, or campaigners for health care access and equity. Organizations may also be ‘keepers’ of symbolic truth. The Mayo Clinic may

hold symbolic truth about practice change, for instance. Symbolic truth will be familiar to designers, Jonathan Ive (Chief Design Officer, Apple Inc.) speaks the truth on design for Apple, for example. The ritual of the studio 'crit' or critique in which the faculty speaks the truth about whether a student's work is 'great design' or not, is another example. It is interesting to consider what truth regime may operate in a design school – who decides what a great design is? Is great design only visible when it is declared as such, if so, then declaring something a great design is a symbolic gesture, and a claim that only certain individuals have the legitimacy to enact. A design may be declared incoherent in the same way that quasi-religious or symbolic truth regimes declare an opposing truth as 'incoherent'<sup>4</sup>.

In the case of the geriatric psychology unit, and indeed across the long-term care and retirement care sector, there is symbolic truth in the idea of "home" and its importance to supporting the care of the elderly in contexts that are not "home" (Rubinstein, 1990). Indeed, stakeholders will routinely state "this is their [patients] home", even though the average stay is 3-6 weeks, or in dialogue on the kind of qualities that are important to consider in the re-design of the unit, state that "it needs to look like a home". Typically, those who make these statements do so in public venues, in front of others, and speak from a position of authority over the unit, its staff, and the design project. In considering the re-design of the unit, scientific truth together with mundane truth, and the integration of knowledge across these through the design process, suggests a re-design that does not replicate home. Students are then challenged with how to address the symbolic truth of the idea of "home" and to communicate proposals that avoid being interpreted as "incoherent".

## 2.4 Governmental Truth in Health Design

Governmental truth generally operates to express truth through the application of category and definition – thereby facilitating the control or direction of behavior including the behavior of organizations, individuals, and technology. Its most obvious manifestation is in policy, programs, guidelines, protocols, algorithms. Authorized speakers of governmental truth can be a faceless bureaucracy, administrators, computer system, or system structure. Governmental truth is a common form of truth in health contexts largely due to the governmental structures of healthcare funding, but also accreditation structures, and the development of practice guidelines to support the aim of quality and efficiency. Design and engineering has its professional associations, accreditation structures, and design guidelines and regulations, as well as the ever present 'health and safety'. In the case of geriatric psychology, there are strict criteria for determining if a person is eligible for admittance to the unit, and equally strict criteria around their length of stay, expectations of care delivery, medication restrictions (sedation for instance) that become the preoccupation of staff on the unit as all these examples determine funding and performance outcomes. This preoccupation can serve to stifle individualized care, and make creative adaptations to the unit difficult to realize. Acknowledging and integrating outcome measures that would support unit performance review in relation to a design project's outcomes may be considered a distraction by students but these metrics may be vital for a healthcare client to justify any spend or staff time. Outcomes and guidelines can easily be translated into design requirements that, given funding and a relatively longer

timeframe, may be tested against existing systems of audit and control. Challenging students to develop proposals for testing and outcome measurement develops competency in thinking across truth regimes and integrating with system structures.

### 3 Building Competency in Knowledge Integration

Using a truth framework to support students' understanding of problem based learning engagements also supports the development of knowledge integration skills. In Table 1 below, which shows a framework containing high level examples from the geriatric psychology unit redesign project, each type of truth regime is identified, along with questions that form a "truth game". Introducing this framework to students in their first semester, the framework is used to support higher-level thinking about the concept of health, wellbeing, and biomedicine. With an initial exposure to social science and medical anthropology perspectives on health and wellbeing, humanistic medicine, and biomedicine, students are ready to work on problem based learning engagements. Working with the framework includes several activities: the framework provides a structure to seek out new knowledge across truth regimes; the framework encourages reflection on the diversity of stakeholder perspectives; the framework provides a reminder to students to actively integrate knowledge across all truth regimes.

**Table 1. Truth Game Design Tool**

	Mundane	Symbolic	Governmental	Scientific
Story Summary	Nurses say the alarms don't work	Our program is world class	Patients should not be sedated unless criteria are met	Patients are diverse with different needs
Who speaks the truth?	Nurse, Patient, family member	Practice leaders	Administrator	Gerontology researchers
Truth vs. Non-Truth	my experience vs. yours	"our program" vs everything else	definition of criteria vs. other factors impacting care	data on dementia and science of 'cognitive decline
Knowledge is understood as...	Experience	Thought leaders	Ministry review	Studying dementia
Knowledge is represented by ...	Anecdote/story	Through story and ritual	Policy	Evidence base



Truth regimes engage in what Weir refers to as “signifying practices” (Weir, 2008) – the representation of truth as a second stage whereby truth is translated via speech, writing, and visual arts.

The framework prompts questions about the role of design, how truth regimes operate in design and design teams, and how truth operates in the process of design. In the case of design, the prototype or model is a form of truth representation. The framework implies that truth regimes share and represent knowledge in different ways and can be used in concert with health sector models of knowledge integration familiar in public health (Gagliardi, Berta, Kothari, Boyko & Urquhart, 2016). For instance, among caregivers for older adults with dementia, knowledge may not reside in the evidence base, but it may be shared in sites for story telling such as online forums, and community centers. Recognizing this, prompts students to consider design engagement techniques that address these sites. The role of the designer is also brought into question by the framework – questioning the role of the designer in integrating knowledge across truth regimes, the position of the designer vis a vis making judgements of the value of certain types of truth over others. Does the nurse’s mundane knowledge of the everyday running of the unit take precedence over the evidence base on flooring choices? What responsibility does the designer have to different truth regimes? How might designer’s ideas and concept work fit within a truth regime or not? And how can the design team integrate different truths in a timely and practical manner?

One of the outcomes of developing and using the truth framework has been a growing realization of the need for design’s truth to be represented in a way that is visible across or within different truth regimes. This prompts the question, in terms of the outputs of a design process – the prototype, the blueprint, etc., how might we develop ways in which design work becomes visible? For instance, for work to be considered in health innovation processes informed by the evidence base, it has to be present in the evidence base in a way that confirms to the truth regime of science. Sketches, photographs are usually not considered, but outcome measures and trial data are. We have discovered numerous design projects addressing design for dementia for instance, that have no visibility in the evidence base, nor do they feature in sites of mundane truth. So, in addition to challenging ourselves and our students to work across different truth regimes during a design project, we are also challenging ourselves to communicate our design work across truth regimes. This includes submitting work to health conferences and journals with our healthcare partners, creating social media assets and communication output for lived experience groups, and engaging in exhibition, and briefing notes that be shared with policy makers.

#### **4 Conclusion**

The experience of developing and implementing the truth framework, to support knowledge integration in problem based learning in health design, has been an additive experience for faculty and students. It is also a challenging model to implement as it requires engagement with the evidence base and evidence based practices, faculty competency in outcome identification and measurement, and engagement with techniques that are informed by medical anthropology and medical ethics. For students, it can be frustrating to divert time and resources to what some perceive as non-design activities. However, the potential for creative and integrative responses to project challenges informed by the use of the truth regime framework is there. Engaging

intellectually with the idea of “truth” and then translating this to the practicalities of design engagements with stakeholders, serves as a real test of the idea and is an appropriate challenge at the graduate level in design education. It also serves to highlight conceptual overlaps between design approaches and truth regime which is proving useful in iterating on design techniques and on hybrid approaches to design in health that integrate across truth regimes.

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