Designing for Health Education: A Multidisciplinary Approach to Visual Communication

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Abstract

Every day, patients receive health information in a number of different formats and from various sources. A consistent communication method that takes visual literacy into account has the potential to add value to the patient education process. Visuals have the benefit of making complex information accessible to various audiences and clinical populations including immigrant population groups, and those with limited native language ability, auditory impairment or deficits in information processing, attention or working memory. The visual understanding of concepts enables more effective and efficient communication with these audiences.

Producing effective visual communication devices that convey complex medical phenomena is difficult. How can meaningful images be developed by clinical staff who don’t have the technical skills to do so, or by designers who don’t have the domain-specific knowledge to produce accurate content? Multi-disciplinary collaboration offers a solution, with an emphasis on bringing together disparate skills. Within this team, the designer functions as visual literacy expert and the health professional as clinical knowledge expert, enabling technical information to be made visible by good design. By merging knowledge bases a holistic approach to visual literacy in health communication can be achieved.

This paper demonstrates that embedding the designer in the health field enables visual devices to be customised to the teaching requirements of the health professional and the learning requirements of the audience. A ‘one-size-fits-all’ approach to the design of visual education materials is avoided. In addition, the importance of prototype testing to optimise visual learning opportunities will be explored. These factors will be discussed within the framework of a qualitative case study in a women’s and children’s hospital in South Australia, focusing primarily on the education of child and adolescent audiences.

Key Words: Collaboration, communication, health education, multi-disciplinarity, patient education, visual communication design

1. Introduction

Visual communication designers are concerned with effective graphic and typographic communication. They engage in an activity that directly impacts knowledge, attitudes and behaviour. This is of particular importance in the field of health in which good visual communication design is a critical factor affecting health outcomes. This paper will explore the value of visual communication in
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health through a case study framework involving multidisciplinary collaboration between designers, health professionals and child and adolescent patients. The primary aim is to develop and describe a model for how designers and health professionals can work together to produce visual communication outcomes that are of most benefit to patients.

Firstly, this paper will discuss existing communication problems in the health field. Visuals will then be explored as a potential solution, followed by a discussion on multi-disciplinary collaboration and how this is necessary to achieve accurate visual representations. The project structure will be outlined, demonstrating how it accommodates a holistic approach to visual communication. Finally, a conclusion will offer final thoughts on the project and goals for the future.

2. Health Communication Problems

There are several barriers to effective health communication and education within clinical settings. A significant lack of interaction time exists, which has negative effects on both patient and health professional communication and understanding. Patients can feel rushed to ask questions while health professionals often feel the pressure of time constraints and everyday work issues which can lead to the use of quick, impersonal, technical communication. Escalating pressure on the Australian healthcare system has increased patient load making efficient communication a priority now more than ever before.

The use of medical terminology or ‘jargon’ can cause confusion and is often misinterpreted by patients. Technical language used in health and medicine is widespread with one study reporting that 50% of physician conversations involve jargon. A more recent study, attempting to explore patient understanding of 10 commonly used medical terms, found that several terms were poorly understood with NPO (nil per os or nothing by mouth) only correctly interpreted by 31% of participants. Jargon is a confusing and intimidating form of communication which can discourage patients from asking for explanations. Analogies also cause problems in that they are often not recognised by patients. For example, one study has shown that 79% of participants did not understand that bleeding and haemorrhage are like terms.

Low health literacy is a significant problem contributing to poor levels of patient understanding and can be defined as the inability to read, comprehend and act appropriately on basic health information. Embarrassment and shame exists surrounding poor health literacy and, for this reason it often goes unrecognised by health professionals as patients actively attempt to conceal it. Without knowing a patient’s capabilities and limitations it becomes extremely difficult to engage in patient-centred communication. The Institute of Medicine, American Medical Association, American College of Physicians, and the Joint Commission have targeted health literacy as a priority area in need of improvement. The support of
these high profile organisations validates the need for studies into improving patient comprehension.

Enabling children and adolescents to achieve adequate health literacy is not a priority in the widely accepted Parsonian and Biomedical health communication models, which emphasise treating the illness rather than addressing psychosocial issues. Communication between children and health professionals is complex due to beliefs about children’s “vulnerability, competency, powerfulness, maturity, dependency, agency and uniqueness...” Health professionals may presume that children of certain ages are unable to understand and participate in the communication exchange. This can affect the level of information disclosed to the patient with the child subsequently becoming a “passive bystander” in the communication process. Furthermore, children’s incomplete or incorrect explanations of their condition are frequently linked to partial parental or clinician explanations. In clinical settings, giving children full explanations about their illness and treatments is not a high priority.

3. Benefits of Visual Learning Opportunities

These problems present an opportunity for improved health communication and education through visual teaching and learning. The use of visuals is not a strategy generally accepted and adopted by health authorities yet it has been proven that humans have a preference for picture-based information (known as the ‘picture superiority effect’). Pictures have the benefit of expressing elements of reality as they are close to sensory reality and experience. Pictures also have the ability to display visual order which can be unclear at a linguistic level. Cognitively, images are more easily stored by memory systems and are superior to verbal communication in aiding memory and recall.

The benefits of visuals can be harnessed particularly well for education purposes in the health field. Pictures can be used to communicate with clinical populations that do not respond well to verbal cues due to auditory impairment or deficits in information processing, attention or working memory. In addition, images are particularly valuable in educating young people as they are central to children’s culture from a very early age.

As well as being more user friendly, visual communication materials that are distributed to patients serve as a permanent record. They act as a ‘frozen language’ which can be referred to in the patient’s own time without the need of a repeated verbal explanation, making them a less transient form of communication. They are also more efficient than oral language because the material can be read and comprehended at a pace dictated by the reader, rather than verbal communication which is comprehended at a pace dictated by a health professional or consultation time limits.
4. Multidisciplinary Collaboration Approach

To achieve visuals that are both accurate and engaging, a multidisciplinary collaborative approach is required. There are many types of disciplinary collaboration and it is worth first mentioning them. Disciplines that share areas of overlap are interdisciplinary, disciplines that transcend knowledge boundaries are transdisciplinary and disciplines that work together across knowledge bases whilst maintaining their individual approach are multidisciplinary.\textsuperscript{22} Collaboration is a social activity that cannot be accomplished by a single person. It involves shared decision making, exchange, integration and synthesis.\textsuperscript{23}

As health professionals are not necessarily talented at producing visuals and designers are not necessarily health experts, these limitations to individual knowledge and skill present a need for collaboration.\textsuperscript{24} Effective solutions to complex problems can only be reached when the skills from various disciplines are integrated.\textsuperscript{25} Furthermore, epistemologically disparate disciplines are more likely to achieve new insight into a complex problem.\textsuperscript{26} See Figure 1 for an example of multidisciplinary collaboration between a designer and health scientist.

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{mouse_intubation.png}
\caption{Belinda Paulovich, 2010, \textit{Mouse intubation}, digital illustration, (detail from a series of images).\textsuperscript{27}}
\end{figure}

A collaborative group consisting of designers and health professionals contains domain-relevant skills and creativity-relevant skills.\textsuperscript{28} This pool of abilities allows for discipline specific rigour and various points of view, providing a diversity of topics for consideration.\textsuperscript{29} This grouping also allows the users to participate as collaborators. It is necessary that both health professionals and patients act as co-producers as they are the end-users of the final product, i.e. the health professional as educator and the patient as information receiver. Merging knowledge bases and skills, and examining visual communication responses from both health professionals and patients, offers a holistic approach to health education. In other words, an integrative approach that considers the perspectives of all parties involved in the education process. The long term goal is to develop this into a model that can be followed by others.
5. Project Structure

Before a model can be developed, the process and outcome must first be tested. I began this investigation last year, designing a collective case study which is primarily qualitative and interpretive in its approach. It is structured as three instrumental case studies, aiming to gain insight into graphic design and health collaboration, and patient and health professional responses to visual communication. The target audience for the graphics is children; therefore the project is centred on young people’s responses to collaboratively designed health graphics.

In setting up this project, I had to make contact with various stakeholders in order to gain access to health professionals interested in participating in a multidisciplinary project. This involved distributing information via a hospital email network through an existing contact. This contact also facilitated two meetings that I attended and presented at. Negotiating access, sourcing interested individuals and ensuring all stakeholders were aware of and supported the project was one of the most crucial steps in the planning of this project.

Three potential paediatric medicine case studies were selected in the areas of rehabilitation, gastroenterology and asthma. Each case study has three overlapping phases:

Phase one involves close collaboration with a health professional to explore ideas for a graphic prototype. Throughout this phase we establish: what needs to be communicated, why it needs to be communicated visually, who is the target audience, and how are we going to communicate the concept to them.

Phase two is prototyping and involves the development of design concepts, and reviews to ensure accuracy. This is the phase where separate skill sets are more apparent, with designer acting as visual literacy and production expert, and health professional acting as clinical knowledge expert.

Phase three is implementation and testing of the graphic prototype. Usability testing involves observing the users interacting with the graphic prototype in real-life education sessions, and interviews where the patient is asked to perform specific tasks with the graphics and answer questions. These tests are conducted with each participant and compared so that a list of the most common problems can be developed. The prototype is improved based on user feedback and re-implemented until a solution is achieved.

Prototype testing is vital as we need to ensure that the visual outcomes from this multidisciplinary collaboration resonate with the target audience. Success of the collaboration model and resulting graphics is measured by patient understanding, patient response and health professional response. Ultimately, success for end-users equates to functionality, efficiency and desirability, and user-testing provides a means of confirming whether or not these measures of success were achieved. Upon completion of the project a short evaluation interview is conducted with the health professional to gain information about their experience.
with the prototype, how they felt about the collaboration and what they felt could be improved.

A qualitative approach is necessary in this situation as it provides context to the data. We need to know the reason behind why things don’t work and this can only be discovered through usability testing and asking questions. We also need to test these materials in a real-life rather than a controlled situation so that we can assess how well such an endeavour can be navigated through unpredictable variables. From this we expect to learn how design and health professionals collaborate, and whether or not the resulting outcomes can be used effectively in patient education scenarios. Engaging in this project is an attempt to gain an in-depth understanding of the communication issues faced by health professionals and patients in a real-life medical setting while at the same time extending my understanding of multidisciplinary collaborative design and patient-centred visual communication.

6. Holistic Outcomes

Throughout this process, the designer is embedded in the health field in areas relevant to each case study. Demonstrations of medical equipment and processes, tours of the department and introductions to other staff members are the primary methods of immersion. In addition, collaboration, observation, interviews and prototype implementation and testing are conducted at the hospital. This is necessary as the designer needs to generate an in-depth understanding not only of the medical conditions to be depicted, but also of the inner workings and relationships between actors in the health setting. Most importantly, the designer needs to know how education is typically delivered. This includes the location and setting of education sessions, the types of health staff delivering the information, and the method of communication, whether it is primarily verbal, written, visual or a combination approach. Whilst conducting the project, its feasibility needs to be examined: is embedding the designer in the health field beneficial, or is it a nuisance for health staff? Does the outcome outweigh the inconvenience? The impact this project has on staff and patients needs to be explored, and we must determine whether it is a worthwhile approach to be implemented by others.

Though there may be problems associated with embedding the designer in the health field, close collaboration is beneficial in that it allows for customisation of education materials. As the health professional has extensive knowledge of their audience and the communication difficulties they experience on a day-to-day basis, they are a crucial contributor to the audience segmentation process, which involves identifying group similarities. Once similarities have been established, messages can be targeted to the group. This is critical as messages that are personally relevant are more likely to be processed via the central route, which is more effective than peripheral processing in establishing behaviour change that remains stable over time. As previously mentioned, the target audience for this project is children and adolescents, and it is necessary for this particular group to participate
in the project so that we can gain insight from those who may benefit most from the outcome. It is important to involve children and adolescents in qualitative research as: “Eliciting children’s perspectives and involving children in research is a necessary element of inclusive, empowering, and socially just research designs”. Working with children in a collaborative manner to increase their understanding of medical phenomena may also position them as “active participants” in the communication process.

Whilst involving children in qualitative research is necessary to advance knowledge, it is also challenging. Interviews should be age appropriate and the questions adapted for different cognitive levels. Consideration also needs to be given to interview structure and style. Children respond well to interviews that combine ‘talk and tasks’ and generally find interacting with something that is physically present to be easier and more interesting. It is also necessary to give thought to personal presentation and behaviour when interviewing children. It is wise to align researcher behaviour and language more with children than with adults. Overcoming these research challenges is necessary to elicit data from the target audience, and to accomplish a truly holistic approach involving perspectives from designers, health professionals and patients.

7. Conclusion

Communication in health is complexly impacted by a number of intricate variables. Time pressures, health professional communication style, the use of jargon, low health literacy in patients and a lack of child-centred communication approaches are issues that can be overcome through the use of targeted visual communication materials. Visuals are beneficial as humans have a preference for picture-based information, and they are more easily stored and recalled than verbal information. In terms of the health setting, visuals are particularly beneficial for clinical populations who do not respond well to verbal cues. In addition, visuals elicit a positive response from children as they are central to their culture from an early age.

To achieve visual communication that is both accurate and engaging, epistemologically different skills must be combined. Throughout this project, the health professional acts as health knowledge expert and the designer as visual literacy expert. Patient feedback also contributes to the overall solution through information gathered during observations and interviews. Artefact production occurs over the course of each case study with information gathered from participants contributing to the outcome. The project structure allows for collaboration to be closely analysed, and for the outcome of this process to be tested on the target audience.

Throughout the project, the designer is embedded in the health field, allowing for insider perspective to be developed. Positioning the designer in this way allows for closer collaboration with the people that know the target audience and their
characteristics best. While it is critical to engage health professionals in the collaborative process, it is also necessary to conduct qualitative research with children to gain a holistic perspective. We need insights from the designer, health professionals and child and adolescent patients to create an approach that is truly collaborative. The long term aim is to develop and describe a model for how designers and health professionals can work together to produce visual communication outcomes that are of most benefit to patients.

Notes

7 Lerner, Jehle, Janicke and Moscati, ‘Medical Communication’, 765.
9 Oates and Paasche-Orlow, ‘Health Literacy’.
10 The Institute of Medicine, American Medical Association, American College of Physicians, and the Joint Commission, cited in Oates and Paasche-Orlow, ‘Health literacy’, 1049.
13 Ibid, 576.
26 Pak and Choi, ‘Multidisciplinarity, Interdisciplinarity, and Transdisciplinarity’.
27 Image produced by the author.
29 Ibid, 11.
32 Ibid, 414.
34 Lambert, Glacken and McCarron, ‘Communication between Children and Health Professionals’, 577.
35 Bourgeault, Dingwall and de Vries, ‘Qualitative Methods in Health Research’.
36 Ibid, 705.
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**Bibliography**


