

## The Cultural Dimensions of an Interdisciplinary Design Approach

Napapong Naparat  
School of Industrial Design, Carleton University, Canada

**Abstract.** This paper is of interest to individuals exploring the concept of an interdisciplinary approach in design. It attempts to investigate and understand the cultural dimensions of the collaborative process of the interdisciplinary design approach in two areas: a) the importance of an interdisciplinary approach to design through reviewing case studies from a research initiative in the UK, "Designing for the 21st Century"; and b) the influence of cultural dimensions on the collaborative process using Hofstede's model of culture. Through the literature review, it is found that communication is the key tool to the success in interdisciplinary teamwork. This paper provides insights and potential outcomes of an interdisciplinary approach to design research.

**Keywords:** interdisciplinary approach, design research, collaboration, culture, communication, teamwork

### 1 Introduction

In the past, the division of labour among the social sciences had been a practical necessity, but it had also caused the unfortunate side effect of overspecialization including compartmentalization, restriction of inputs, restriction of methods, and triviality of outputs (Hofstede 2001). The currently emerging interdisciplinary approach to research and studies of various fields is perhaps a defying effort in knowledge acquisition to overcome conventional limitations. The ubiquity of an adjective, *interdisciplinary*, in modern academia is inarguably a good indication.

Our time's increasingly crossbred culture (Albrecht, Lupton & Holt 2000) and today's higher demand for design usability and enhanced experience from the general user justify the prevalence of an interdisciplinary approach. It is particularly common in design research and practice to approach a complex problem from various angles and using various methods, which combine multiple disciplines.

The term, though commonly used, is not always clearly defined and may imply different meanings depending on its context of use. *Interdisciplinary* implies involving two or more disciplines in the process of problem solving or understanding a

common subject. The result is usually a more consummate knowledge of the subject matter. Consequently, it allows for new insight as the conventional boundaries between disciplines are blurred through recognizing a shared problem and a common goal of understanding.

Take a museum's exhibition project, for example, it likely entails the expertise of a designer, architect, curator, fabricator, etc. Even further broken down within the realm of design, the project easily requires exhibition, graphic, and industrial designers. In fact, it is becoming impossible to imagine a design research or development process that only requires a single area of expertise.

With an interdisciplinary approach can come cultural diversity, on both small and large scales. This paper thus examines the cultural dimension of the collaboration that occurs within the interdisciplinary design approach by reviewing literature on two specific areas. First, the importance of an interdisciplinary design approach is explored through case studies from a research initiative in the UK called *Designing for the 21st Century* (2007). Second, the influence of cultural dimensions on the collaborative process is investigated using Hofstede's model of culture.

### 2 The Importance of an Interdisciplinary Design Approach

It is becoming more obvious that many problems, issues and opportunities we face in today's society can only be explored through an interdisciplinary research approach. The UK Research Councils (2008) note that "novel interdisciplinary research is needed to solve many, if not all, of the next decade's major research challenges". In addition, the Cox Review (2008) has recently recognized the contribution of design and creativity to the UK's national competitiveness. It stresses the importance of how creativity and design can play a vital role, but only when integrated with technology and business and that an interdisciplinary

approach is the key. This is axiomatic considering how design is changing along with advancing technologies, competitive business pressures and higher social expectations; they all demand better design solutions to increasingly complex problems.

To understand the importance of an interdisciplinary approach to design research, the author of this paper review case studies from the recent and ongoing research initiative in the UK, *Designing for the 21st Century* edited by Tom Inns. This is because the Research Initiative, conceived in response to demands for new understanding in the design domain, particularly focuses on collaborative aspects of an interdisciplinary design approach. Inns (2007, 13) claims:

*Design practice needs to be highly adaptive and innovative to meet the needs of this rapidly changing operating environment. Generating the new knowledge and understanding needed to support these developments requires a collaboration of minds and provides some clear challenges for those engaged in design research.*

### 2.1 Research Initiative: Designing for the 21<sup>st</sup> Century

To many, the concept and process of an interdisciplinary approach in design research and practice is still novel, hence can be unclear. The following briefly explains the stages of the *Designing for the 21st Century Research Initiative* as an example to help illustrate the process.

In September 2004, 21 out of 129 proposals were selected as Phase 1 research cluster projects. Each research cluster was formed with the hope of building new relationships within the design research community among those who share common ground but without previous opportunity for collaboration. Some of the 21 cluster topics include: *Group Creativity in Design*, *The Healing Environment*, *Discovery in Design*, *Synergy Tools*, *Embracing Complexity in Design and Sustainability for Meta-design*. Each research cluster explored their predefined theme through five stages in Phase 1, representing a journey in building interdisciplinary understanding. The five stages are: a) identifying common goals, b) pooling different approaches, c) building a coherent view, d) distilling insights and questions, and e) planning outputs and closure.

Inns (2007, 18-21) further explains each stage as follows. Identifying common goals involves defining the research topic in an open way to stimulate interest from various disciplines as well as encouraging

participation. Pooling different approaches relies heavily on articulating and building respect for the diverse qualitative and quantitative research approaches within the team. This often requires for mediation between rigour and holism in pursuing the research topic. Building a coherent view among multiple participants from diverse fields can be a challenging stage, as it entails mapping existing knowledge and understanding within each area of research. It is noted that, "Most [participants] were largely unaware of the extensive body of existing design research although being active in their particular areas" (Parmee 2006, 19). This can also be difficult for certain areas of design practice where knowledge is still developing or highly tacit and thus not well articulated in a written form. Distilling insights and questions can also be complicated as it involves conciliating between the interests and aspirations of each individual participant. Lastly, planning outputs and closure captures the outcome of the collaborative effort of an interdisciplinary approach in design research. This may include bidding for funding for project continuation as well as developing a webpage for data presentation.

### 2.2 The Significance of Communication

Johnson et al.'s research project included in the Research Initiative proceedings demonstrates the significance of communication within the interdisciplinary approach to design research. One of their high-priority research questions is "How to overcome communication breakdowns in collaborative creative design process?" They find that ideas, such as better support for communication and facilitating breakthroughs from breakdowns, were readily put forward to help induce "a more streamlined design process and more creative products". This also involves conflict resolution and management through communication while conducting interdisciplinary design research (Johnson et al. 2007, 190). This study, in particular, not only shows the importance of communication in an interdisciplinary collaboration but also the similarities and overlaps in theories and practice among various disciplines in the creative domain.

From reviewing various case studies in the Research Initiative, it becomes apparent that there are many challenges related to work dynamics in an interdisciplinary approach since it primarily depends on collaborative effort or teamwork. With numerous members involved, the process not only implies diversity in the disciplinary background but in the cultural background as well.

### 3 The Influence of Cultural Dimensions

Cultural dimensions in terms of diversity exist on both small and large scales within an interdisciplinary approach. The diversity in team members' cultural backgrounds may be relatively small compared to the diverse culture of settings where the project may actually take place. The characteristics of a particular context, especially the national culture will likely influence the process and dynamics of the interdisciplinary approach. This paper has chosen to examine the cultural dimensions of an interdisciplinary design approach by referring to Geert Hofstede's model of culture (2005). His theories, based on studies of the impact of cultural differences on group dynamics in work environment, have been applied to interpret a large variety of cross-cultural research findings. Various disciplines that use Hofstede's theories include cross-cultural and organizational psychology, sociology, management, and communication. Hofstede's model of culture is thus used in this paper to help identify the potential challenges to collaboration, key to the interdisciplinary design approach. The author of this paper are particularly interested in how different cultural settings can help promote the collaboration among various disciplines.

#### 3.1 Hofstede's Model of Culture

To address the influences of national culture, Hofstede proposes a model of culture – how world cultures vary along five consistent dimensions. He argues that world cultures vary along five consistent dimensions: power distance, individualism vs. collectivism, femininity vs. masculinity, uncertainty avoidance, and long- vs. short-term orientation. Hofstede's findings and theories are based on surveys conducted in international subsidiaries of IBM between 1967 and 1973, the results of which were entered into an IBM database. The primary goal of the survey was to research the work attitudes of international employees. It is important to bear in mind that the dimensions are not distinct. They do overlap and correlate with each other to a certain degree (Callahan 2005).

Hofstede's original five dimensions have been recently revised and expanded in *Cultures and organizations* (2005). The dimensions are summarized as follows:

*Power distance – The extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally (46).*

*Individualism vs. collectivism – Individualism pertains to societies in which the ties between individuals are loose: everyone is expected to look after himself or herself and his or her immediate family. Collectivism, as it's opposite, pertains to societies in which people from birth onward are integrated into strong, cohesive in-groups, which throughout people's lifetimes continue to protect them in exchange for unquestioning loyalty (76).*

*Femininity vs. masculinity – A society is called feminine when emotional gender roles overlap: both men and women are supposed to be modest, tender, and concerned with the quality of life. A society is called masculine when emotional gender roles are clearly distinct: men are supposed to be assertive, tough, and focused on material success, whereas women are supposed to be more modest, tender, and concerned with the quality of life (120).*

*Uncertainty avoidance – The extent to which the members of a culture feel threatened by ambiguous or unknown situations (167).*

*Long- vs. short-term orientation – Long-term orientation stands for fostering of virtues oriented toward future rewards, in particular, perseverance and thrift. Its opposite pole, short-term orientation, stands for the fostering of virtues related to the past and present – in particular, respect for tradition, preservation of "face", and fulfilling social obligations (210).*

It is not hard to imagine how each of these five dimensions can influence the dynamics of an interdisciplinary team. Perhaps the two most prominent dimensions related to collaboration or teamwork are power distance and individualism vs. collectivism. To practice an interdisciplinary approach in a high power distance environment, where tall hierarchies in organization as well as strict relationships between superiors and subordinates are in place, can impede the process while leading to an inhibition of ideas as team members are less likely to express opinions. In many ways, an interdisciplinary approach inherently implies egalitarian attitudes in working and decision making. Even though there is still a need for a member to assume the leader role, they ideally serve to facilitate and mediate conflicts during the process. Individualism vs. collectivism aspects of the culture can also both benefit and hinder the collaborative effort of an interdisciplinary team. In collectivist cultures, everyone pursues the group's

interest and this view is essential for successful collaboration. On the other hand, a unique design solution often comes from an individual's self-expression and autonomy, which are traits not fostered by collectivists.

It would be unrealistic to claim that one extreme of these dimensions is more conducive to an interdisciplinary approach. This is because each member that makes up the multidisciplinary team undertaking an interdisciplinary approach in design research is unique. The combination of each member's skills, experiences, and backgrounds contributing to the teamwork is special and unrepeatable. The challenge of the collaborative success lies in the balance of work style and communication. Communication helps convey multicultural understanding, which unquestionably is imperative and ultimately leads to intercultural cooperation. Being aware of the potential cultural differences as shown in Hofstede's theories can facilitate cross-cultural interactions, inevitable in pursuing an interdisciplinary approach as it helps achieve effective communication.

#### 4 Insights for an Interdisciplinary Approach

If an interdisciplinary approach is the new take in design research, perhaps it is beneficial to look at what it may potentially bring with it. According to Inns' *Designing for the 21st Century* (2007), the Research Initiative workshops have helped generate *Insights for Design*. These include four new emergent positions for design as well as six emergent roles for the designer. To many who are already involved in interdisciplinary processes, the following list may help define and confirm existing roles or changes.

The four new potential positions for design are: a) redefinition of existing design disciplines, b) development of new design disciplines, c) development of meta design disciplines, and d) development of "design outwith design". Redefining existing design disciplines is expected if not already happening. Sharing design strategies will help deal with overlapping of new and changing operating contexts. Newly emerging needs along with complex problems will likely prompt new development of design disciplines for instance *Sensory Design*. The shared needs and overlapping contexts of 21st century issues such as sustainability, health and security will inevitably result in the development of meta-design disciplines. They will bridge between existing design approaches and help navigate existing frameworks of various disciplines. Finally, the development of "design outwith design", outwith

being a quaint medieval term associated with being beyond the city walls, helps designers go beyond their realm (Inns 2007, 23). This can be accomplished through exploring and understanding the values of design and design knowledge outside of its traditional boundaries.

The potential six emergent roles for the designer are: a) negotiator of value, b) facilitator of thinking, c) visualiser of the intangible, d) navigator of complexity, e) mediator of stakeholders, f) coordinator of exploration. The additional roles are for consideration and not to replace the established activities and skills associated with each design discipline. Inns (2007, 24-6) describes them as follows: As value is increasingly multi-dimensional, designers become a negotiator of value by being more involved in decision making, for instance ecological and ethical aspects. As a facilitator of thinking, the designer will need to answer "How do we design, [and how can we] design to allow extended participation?" It entails knowing how to mobilize and energize the thinking of others. Design nowadays transcends physical objects and thus requires the designer to visualize, prototype, test and potentially implement the concepts of the abstract and intangible, such as relationships, emotions and experiences. "The interdisciplinary world is a world of complexity and ambiguity". The design can help us understand complexity and in the process it may help us better understand our roles. The designer has to mediate since an increasing number and type of stakeholders are now involved in a design solution. Multiple requirements usually reflect different perspectives, needs, and expectations of varying stakeholders. As a coordinator of exploration, highly evolving technologies and expanding design boundaries will demand constant exploration of ideas.

By taking an interdisciplinary approach to design research and practice, the necessary collaborative effort conjures many new ideas and possibilities through cross-disciplinary communication. The aforementioned emerging positions for design disciplines and roles for designers are only a fraction of the potential outcome of this synergy.

#### 5 Conclusion

Although the concept of an interdisciplinary approach in design may be fairly recent, the idea of collaboration or teamwork is not. Lanzara (1983) states:

*[A] large part of the design process, especially in large-scale projects and organizations involving several actors, is not dedicated to*

*analytical work to achieve a solution but mostly to efforts at reconciling conflicting [conceptual] frames or at translating one frame into another. Much work of the designer is... concerned with... defining collectively what is the relevant problem, how to see it.*

The emphasis here is on working collectively. As one can imagine this is not always an easy process and despite the aligned interest and visions, collaboration can be messy (Pieprz 2008). Through the literature review, both the Research Initiative and Hofstede's model of culture point towards the issue of communication. Communication plays a vital role in any collaboration since it is an inherently social process (Eckert, Maier & McMahon 2005).

As we march into the new territory of an interdisciplinary approach in design, new ideas and understandings are bound to be discovered. This paper has provided examples in an early phase of interdisciplinary design research and identified some key components to the interdisciplinary success, namely collaboration, culture, and communication. These elements merely serve as guidelines where the success, still to a large extent, depends on each individual's contribution to the interdisciplinary approach. Though the concept of interdisciplinary may be relatively new to some designers; collaboration, culture and communication are omnipresent. Despite the fact that these traits are essential in daily interactions, it is perhaps the combination and application that make it a challenge. Being open-minded and making the best use of modern technology's abilities to communicate will help blur borders and bridge divides of disciplines and cultures.

*Change is ever present, as the challenges of technology, environment and society demand our continuous attention and we struggle with issues of complexity, we see that the science, social science and humanities need a means of working together. Design research provides the orchestration, the systemization and visualization to bring together the disciplines to build bridges to the future. Such research will provide the evidence and insights upon which professional designers, industry and society can create solutions and contribute to global wellbeing. (Cooper 2007, viii)*

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