

## Chapter 2

# Independent Working, Collaboration, and Team Activity

**Abstract** Although many artists and designers choose to work independently, those who also work with the academy often share ideas about future artworks or designs, and also local and national grant funding opportunities. Collaboration and team working may enable larger and more complex projects to be undertaken. Artists have been able to contribute to new kinds of projects within the artistic world, and also work with scientists to stimulate creativity and produce new knowledge. Such a Renaissance team could include expertise on the use of color, visual paradigms, and metaphors. Interdisciplinary collaborations can have significant potential but can be difficult to implement and manage. However, new knowledge and new disciplines can arise at the boundary between existing disciplines. Thus, the potential for a major breakthrough is significant. The challenges for interdisciplinary collaborations are discussed. The use of digital tools can have a positive impact on the arts and cultural organizations. They can also be used to support and facilitate collaborations—both online and off-line.

**Keywords** Collaborative art and design • Creative collaboration • Renaissance team • Digital tools • Interdisciplinary collaboration • Interdepartmental laboratories • SciArt

## 2.1 Introduction

Art and design are participatory tasks on the part of artist and designer. An artist communicates with their artwork during the course of its development, as they iterate to the final work. A designer interacts with their design during the design process. Although many artists and designers choose to work independently, those who also work with the academy often share ideas about future artworks or designs, and also local and national grant funding opportunities. Artists and designers who normally work in the academy, or as part of another organization or company, are already part of a community and probably also a team with cognate interests. Those who choose to work alone, or in isolation, still rely on the outcome of their work,

and to be able to communicate it effectively to one or more third parties. For an artwork, it is to those who view it. For a designed object or building, it is to those who commissioned it, have to approve it, have an interest in it, or will ultimately live or work in it.

## 2.2 Collaboration

Artists have used collaboration to complete large-scale works for centuries, even though the public perception is often that artists work alone [1, 2]. Collaboration between artists may be due to a shared interest in the subject matter, the methods of working, or the size and complexity of the artwork produced.

Constituent elements of collaboration include the following:

- Motivation—the objectives and benefits of the project
- Communication—dissemination of information about the project
- Sharing—ideas and an understanding of their ownership
- Support—how the collaborators can help each other
- Problem solving—getting round difficulties or changes in direction in the project
- Diversity—utilizing a variety of skills and expertise when required [3].

Collaborations may differ in their emphasis and in how they work depending on the circumstances, the collaborators, and the project.

## 2.3 Creative Collaboration

A creative collaboration has the goal of creating an outcome, and the team's objective is to achieve this goal. A team may be needed rather than a single individual because of the volume of work, or because the multifaceted nature of the task requires multiple skills.

Artists have been able to contribute to scientific analysis and enable new results to be produced [4, 5]. Such Renaissance teams can stimulate creativity and produce new knowledge [6] in a way that would be very difficult, if not impossible, for a single artist to do on their own. SciArt is a term used to describe the artistic contributions that can be made to scientific investigations [7].

According to Cox, it is necessary to consider some codes of behavior for successful teams to be able to work successfully:

1. There must be a common, passionate goal for the team members
2. Members must have mutual respect for each other member and his/her discipline
3. Each member must be willing to learn from other members of the team
4. Each member must recognize other's intellectual territory

5. The team should not have too many members
6. The team must continually check to make sure that the research is making progress
7. Members must not become overcommitted to other projects
8. One person must carry the flag for project as a champion and coordinate efforts
9. Each member must be credited and given his/her recognition when the project is presented or publicized
10. Each member must get something out of the project which is personally rewarding and tangible [8].

### Connective Collaboration

A connective collaboration taps into the potential contributions and expertise of individuals in the community. Social media may facilitate this kind of collaboration.

### Compounding Collaboration

This builds on the previous work of others and takes it further [9].

## 2.4 Digital Technology

Digital technology can contribute to the arts and cultural organizations. NESTA's Digital R&D Fund for the Arts [10] supports ideas that use digital technology to build new business models and enhance audience reach for organizations with arts projects [11].

A variety of digital tools are available for supporting collaborations [12].

## 2.5 Interdisciplinary Collaboration

Snow [13] identified cultural differences between science and the humanities which made communication across the divide difficult. It is unclear whether this was due to differences in language and vocabulary between the arts and the sciences, particularly the technical terms often used in the latter area, or whether there were more fundamental differences. Critchley [14] proposed that Snow:

*diagnosed the loss of a common culture and the emergence of two distinct cultures: those represented by scientists on the one hand and those Snow termed 'literary intellectuals' on the other. If the former are in favour of social reform and progress through science, technology and industry, then intellectuals are what Snow terms 'natural Luddites' in their understanding of and sympathy for advanced industrial society. In Mill's terms, the division is between Benthamites and Coleridgeans [14].*

However, Gould took an opposing point of view and emphasized the commonalities between science and the humanities [15]. In 1963, Snow appeared to take a more optimistic view about the relationship between science and the arts and [16].

Shneiderman [17] advances the case for combining applied and basic research and a new paradigm for interdisciplinary collaboration that puts engineering and design on an equal footing with basic science.

Advancing interdisciplinary research can be a major challenge and some of the current difficulties were outlined in [18].

## 2.6 MIT Media Laboratory

The MIT Media Laboratory is an interdisciplinary research laboratory at the Massachusetts Institute of Technology devoted to projects at the convergence of technology, multimedia, sciences, art, and design.

A recent advertisement (November 2016) for a faculty position at the MIT Media Laboratory indicates the importance attached to interdisciplinary expertise (and beyond traditional disciplines), delivery, and real-world applicability [19]:

*The MIT Media Lab is seeking a candidate to fill one tenure-track faculty position. Appointments will be within the Media Arts and Sciences academic program at the junior faculty level. The Media Lab is an antidisciplinary lab with decades of experience in the development of new technologies for social change and longstanding involvement in societal development.*

*Every country is a developing country in its own way. Both rich and poor nations face development issues, from mass incarceration and institutionalized segregation, to inadequate housing and lack of economic opportunities. To help address the deep development problems affecting countries at all levels of income, the ideal faculty candidate should be focused on development by creating and testing enabling technologies, as well as advancing the understanding of the core issues underlying development problems. Candidates should have a strong record of research and practice, a willingness to take risks, a desire to look beyond traditional disciplines, and a dedication to making a difference in the world.*

*You can be a designer, inventor, scientist, or scholar—any combination—as long as you make things that matter. Impact is key. A doctorate or equivalent experience is required.*

*Successful candidates will be expected to: establish and lead their own research group within the Media Lab; pursue creative work and research of the highest international standard; advise master's and doctoral students; participate actively in the Media Lab community; and teach at the graduate level in the Media Arts and Sciences program.*

*To apply, please fill out the application (<http://apply.interfolio.com/38628>). Applicants will be asked to upload their CV, personal website URL, links for three publications, the names (and contact information) of three references, and a personal statement of no more than two pages that includes the applicant's plans for exploring big ideas and challenging questions, and discusses what the applicant will bring to the Media Lab and how the Lab will enable you to accomplish your goals.*

**Application deadline: December 20, 2016**

*MIT and the Media Lab have a strong commitment to diversity in education, we especially encourage minorities and women to apply. MIT is an Equal Opportunity/Affirmative Action Employer. EOE.*

*Questions? Contact [faculty-search@media.mit.edu](mailto:faculty-search@media.mit.edu) [19].*

As a world-leading institution, MIT is able to attract major industrial sponsors at international level to fund projects in the MIT Media Laboratory [20]. However, the founding of the Laboratory was not without its challenges and difficulties given that MIT was perceived as a world-class technology institution with highly performing engineering departments. Nicholas Negroponte was able to expand into digital media by building on earlier initiatives in the Architecture Machine Group within the School of Architecture and Planning, with the help and support of a former President of MIT, Jerome B. Wiesner. This was able to overcome any challenges and potential opposition within the institution. However, in universities of lesser standing there has been opposition from traditional engineering departments to new initiatives of this kind as they are perceived as ‘diluting the brand’ of engineering. Strongly performing departments wish to protect their position and reputation against any perceived threat, particularly in competitive environments for funding internally and externally. The MIT Media Laboratory is still within the School of Architecture and Planning, whereas in other institutions they tend to have closer connections historically with departments in the areas of computer science, electronic engineering, or media and arts.

There is increasing evidence that the value and significance of interdisciplinary research and development is being recognized in leading universities. The provost of MIT indicated that MIT’s success in achieving its fifth position in the World University Rankings in 2016 was principally due to its interdisciplinary approach [21], which was fostered through interdepartmental laboratories, shared facilities, and initiatives centered on global problems [22]. Working across disciplinary boundaries in a collaborative way enabled faculty and students to see opportunities that might not otherwise be seen if they were working in a disciplinary silo. In addition, the interdisciplinary approach was also implemented at undergraduate level, where all undergraduates were required to take at least one humanities or social sciences subject per semester, regardless of their specialism.

This may be less common in other institutions where students are more strongly tied to their home academic department throughout their undergraduate studies, often for financial reasons as well as traditional academic practice. In Europe, students tend to graduate in a particular subject, whereas in the USA although they may have a major subject, they can accrue credits by taking other subjects as well that count of equal weight on the final transcript. Some universities in the UK are moving to transcripts in the interests of transparency and openness toward the student, as well as potential benefits to employers (as they can see the student’s progress throughout the course, not just the result of the final examination). However, some institutions only include the final year marks in the transcript, as this is the primary, or sole, measure used to decide the class of degree to be awarded to the student [23, 24].

Universities of lesser standing than MIT may find it difficult to attract external sponsorship for research and development in new and novel areas. Obtaining funding for interdisciplinary research proposals in many institutions can be difficult simply because such proposals may fall outside the traditional expertise of grant awarding bodies.

## 2.7 Arizona State University

Universities have long-standing traditions with regard to disciplines and structures. When these are well established, they are slow to change because they are thought to represent the collective wisdom of faculty over many years. Universities are also reluctant to change these disciplines and structures for the same reasons. However, if there are major changes in society, or the challenges that society faces, it is possible that these traditions and structures are not able to optimally address these challenges, simply because they have been founded in the past when society was different. Arizona State University has implemented a major restructure designed to address major social and environmental challenges by enabling it to operate beyond traditional discipline boundaries. The objective is to *‘advance research and discovery of public value and assume fundamental responsibility for the economic, social, cultural, and overall health of the communities it serves’* [25].

The redesign of the university aims to *‘maximize its potential to generate the ideas, products, and processes that impact quality of life, standard of living, and national economic competitiveness’* [26–28].

## 2.8 The Challenges of Collaboration

Collaborating across different subject areas can present a number of challenges. These can include the following:

- Different vocabularies to describe the disciplines
- Different norms and expectations for each discipline
- Different working practices for each discipline
- Different paradigms for evaluation of outcomes in each area
- Different budgets, resource allocation models, and resource center boundaries.

Innovation and creativity are challenging concepts to apply across disciplinary boundaries—for the reasons set out above. They are even more challenging when applied to new disciplines and new areas of research, from which new outcomes may emerge. At the same time, many fruitful innovations have come about because artists, scientists, and technologists with different perspectives and skills have combined to produce something completely new. For example, it can be argued that the fields of oceanography and cognitive science emerged from multidisciplinary collaborations [29].

Earnshaw [30] stated:

*Some would argue that as existing disciplines have become well established, then it is more likely that new disciplines will tend to emerge along the boundaries of existing ones, rather than within them, and contain some of the elements from more than one discipline. Thus working at the boundary, or across the boundaries, is likely to be more fruitful in terms of research and developing new knowledge. However, this is not without its risks as noted by*

*Blackwell et al. [31] because of the silo effect of current disciplines, as well as other factors. It is also well-known that interdisciplinary research tends to be less well understood by reviewers from the established disciplines because it is not regarded as sufficiently pure or traditional, or it may cut across the norms and conventions that have been established within a particular discipline.*

*A further challenge has been noted by Snow [32] which is the antipathy between the arts and the sciences brought about by a long history of different understandings and modes of discourse about the world, and also the changes brought about by the Scientific Revolution [33]. These different modes of discourse, and understanding of what is regarded as relevant or significant, can make it difficult to accomplish interdisciplinary collaborative research. Yet it may be precisely this research that yields the new insights and the new forms of understanding that open up the future.*

Multidisciplinary, interdisciplinary, and transdisciplinary research are identified by Holzbaaur et al. [34] as different aspects of collaboration across boundaries. The existing structures of knowledge and information may be inadequate to cope with their future expansion. Knowledge is increasingly interdisciplinary, and the traditional barriers between existing disciplines are being broken down in order to make progress. One way to begin to understand this transition, and start to address this challenge, has been set out by Wilson [35].

Cognitive diversity enables groups to find better solutions and also facilitates finding solutions when the problems are complex. Thus, collaboration across discipline boundaries may yield more ground-breaking results than collaboration within a discipline.

One effect of modern technology such as the Internet and the World Wide Web has been to break down traditional barriers. Formerly, collaborators were colocated within the same physical unit or structure in order to facilitate interworking. Virtual working now allows researchers to collaborate across time and space, sharing ideas and theories, experiments, simulations, and results [36, 37]. In theory at least, research and collaboration know no boundaries.

## 2.9 Conclusions

Pohang University of Science and Technology (Postech) ranks at position 104 in the World University League Table for 2017, 40th in engineering and technology 2017, and first in the world's top 100 universities under 50 years old by Times Higher Education for three consecutive years from 2012 to 2014. Its commitment is to—*“be a trailblazer exploring uncharted territories in higher education and research and prepare to take its next leap forward as a world-class institution of higher learning”*. Postech has set up a new Dept of Creative IT Engineering:

*The Department of Creative IT Engineering (CITE) is an academic unit of the POTECH i-Lab which was selected as a host institution for the ‘IT Consilience Creative Program’ by the Ministry of Knowledge Economy (MKE). The Department aims to train creative talents who will be on the nation’s future frontiers in IT engineering. The IT Elite Program was launched by MKE to establish a university lab, comparable to the MIT Media Lab, and to*

*foster convergence-oriented creative talents who will be the leaders of the global IT industry. The Department represents a new chapter of challenge for POSTECH, and pushes forward a model of education and research with the support of the POSTECH i-Lab [38].*

The attributes of the education and research programmes are—“*Creative, Collaborative, Cultivating, and Convergence*”.

Mark Gatenby in an article on the Utopia [39] presents the case for creating ‘*new spaces for universities that can be occupied by post-disciplinary thinkers who want to think about the world in more open-minded ways*’:

*In his recent book, The Hidden Pleasures of Life: A New Way of Remembering the Past and Imagining the Future, Theodore Zeldin, the conversationalist philosopher, notes how over millennia human civilisations have clashed through two contrasting visions of social life. On the one hand, there is the view of civilisation as a city-fortress, surrounded by walls, protecting itself against barbarians and rejecting the vices of the external world. On the other hand, there is the city-port, always hungry for what it does not possess, searching for a better life by trading with strangers and importing novelties without too many worries about where they might lead. Many university disciplines have become more like the former than the latter. Threats of government policy, markets and commercialisation have led to their becoming increasingly defensive and closed in.*

*If we go back to More’s island imagery, we can think of universities today as drifting archipelagos of academic disciplines. Each island has a cathedral at its centre, extolling the discipline’s canons and creeds. The occupation of every islander is to serve the unending process of building and embellishing the cathedral. And the limited size of most islands gives their inhabitants a continual and inescapable reminder of their vulnerability to the dangers posed by foreign lands [35].*

He reminds readers of the lectures given by the President of the University of Chicago, Robert Hutchins, in 1953:

*In 1953, the president of the University of Chicago, Robert Hutchins, gave a series of lectures on the University of Utopia, asking what universities should ideally become. Hutchins was a traditionalist in the Western canon, believing that universities should build a compulsory core curriculum that all students should master as the foundation, before specialising in a profession or occupation. But Hutchins also believed that the University of Utopia would be a connected and coherent intellectual community, not a dispersed archipelago. “In Utopia,” he wrote, “the object is to make it possible, and even necessary, for everybody to communicate with everybody else. Therefore, the University of Utopia is arranged so as to force, in a polite way, the association of representatives of all fields of learning with one another.”*

*I am not Utopian enough to think that contemporary university departments will ever coalesce around a core curriculum shared by all students. But I do believe that “disciplinarity” has reached its limit and should be looked on as a twentieth-century idea. Disciplinary theories and methods have become too insular to address important questions in the contemporary world [39].*



## Further Reading

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