Arts and the Innovative Workplace

December 2013

MICHIGAN STATE UNIVERSITY

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This project was made possible with support from the Michigan Council for Arts and Cultural Affairs Service to the Field Grant Program

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Acknowledgements

The project team would like to acknowledge, with appreciation, the following advisory committee members who provided valuable advice and guidance throughout the project:

Omari Rush
Education Manager
University Musical Society, University of Michigan

Kurt Dewhurst, Ph.D.
University Outreach and Engagement, Michigan State University

John Monberg, Ph.D.
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MessageMakers, Lansing, MI

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Leslie Donaldson
Arts Council of Greater Lansing

Dave Morris
Michigan Economic Development Corporation

Tracy Brower, Ph.D., MM
Herman Miller, Zeeland, MI

The research team is particularly appreciative of the time and insights the leaders of Michigan's entrepreneurial community gave to this study and the Michigan State University, College of Arts and Letters and the Michigan State University Office of Outreach and Engagement whose additional support made this research possible.

The statements, findings, conclusions and recommendations are solely those of the authors and do not necessarily reflect the views of the Michigan Council for Arts and Cultural Affairs or Michigan State University.

Executive Summary

This study builds on the previous research linking arts practices with innovation, the creative work force, and economic development. It addresses three specific questions through analysis of a sample of innovative, high growth, high wage firms in Michigan. First, how do entrepreneurs and innovators apply skills learned through arts training and practice to their professional work? Second, how and to what extent do these individuals participate in community development and community arts endeavors? And finally, how do innovators design and organize their work environments in ways that facilitate and encourage creative productivity? Our study reveals the following findings:

- Over 40% of innovators in our study report lifelong arts and crafts participation. A majority report directly applying knowledge acquired from arts and crafts practice to their day-to-day work. Approximately 40% believe an arts background is essential to innovators and would include consideration of such a background in hiring decisions.

- The analysis uncovered a puzzling missed connection between the local arts and cultural community and globally connected companies. While respondents reported a high overall degree of arts and crafts involvement, the propensity of these entrepreneurs to support philanthropic activities targeting the local arts community was limited. This "*gLocal Paradox"* suggests the importance of relationship building on the part of the arts community with emerging global companies in their early start-up phase.

- The study also found a significant relationship between flexibility in employment practices and innovativeness among high growth firms in both start-ups and more mature companies.

- In terms of the physical work environment, more established firms were found to be more likely than start-ups to invest in design and layout. As companies mature, workspaces become increasingly important in attracting and retaining talent and enhancing creative and innovative productivity.

The findings of this study suggest recommendations in three key areas:

1) Public policymakers should respond to the growing evidence of linkages between arts and crafts exposure and entrepreneurial success within 21st century workplaces by supporting arts and cultural institutions.
2) Arts and cultural organizations are encouraged to recognize the importance of relationship building with early stage companies in their regions for long term mutual benefit.
3) Local and regional economic development professionals should carefully consider the design, layout and equipping of business accelerator and incubator spaces in order to encourage creative exchange and productivity.

Background

One of the central ideas that has emerged within contemporary economic development theory is that a thriving arts and cultural scene can be a vital driver of economic growth in communities, cities and regions (Clark 2004; Florida 2002; Glaeser, Kolko and Saiz 2000; Markusen and Schrock 2006; Scott 2000, 2005; Zukin 1995). In this period of heightened economic globalization and a shift to a so-called knowledge-based economy, a community's artistic and cultural assets are increasingly recognized as essential to a place's economic development strategy, creating the conditions necessary for innovation and creativity to originate and thrive. Moreover, while much recent work has focused on how artistic and cultural workers can play a role to rejuvenate urban centers, creative people and their innovations have long been recognized as generators of economic vitality (Jacobs 1961, 1969). In particular, scholars and economic developers see three main types of advantage in the presence of creative and cultural assets. First, a flourishing arts and cultural sector is a jobs generator, with direct economic benefits (Markusen 2004). Second, the presence of artists and cultural assets signify a high quality of life and provide amenities that are said to attract and retain both innovative businesses and human capital (or the oft-used term, “talent”) (Florida 2002). Third, an arts-enriched environment stimulates the creative capacity of current and future generations of workers (Pink 2005).

Other streams of research point to a link between an individual’s arts participation throughout various life stages and both academic performance and subsequent innovativeness at the career stage. For instance, child researchers have shown that arts exposure and practice among children develops their creative potential by enhancing their problem-solving capacity and analytical thinking skills. This work reveals that students with a background in arts education score higher on tests related to spatial reasoning as well as engineering and science classes as compared to students lacking such a background (Alias, Black and Grey 2002; Deno 1995; Lord 1985; Sorby 2009; Sorby and Baartmans 1996). In 2010, students with 4 years of arts or music classes in high school and AP/Honors courses scored higher on the Standardized Aptitude Test (SAT) in reading and math (See, e.g. College Board and the National Merit Scholarship

Corporation, 2010).[1] Research also shows that the benefits of early participation in arts education extend well beyond childhood, with tangible economic implications. For instance, historians of science have consistently found that the most productive and innovative scientists were trained or participated in creative avocations (Billington 1985, 1997; Hindle 1981; Root-Bernstein 2001). What is more, these advantages spur professional success and spillover beyond the individual to achieve community-level economic development. In one study, research indicates that the most eminent and innovative scientists are significantly more likely to engage in arts and crafts avocations than the average practitioner (Root-Bernstein, 2008). Another body of work suggests that this same occupational group gains imaginative and creative skills from their artistic practices that have direct professional benefit (Root-Bernstein, Bernstein, & Garnier, 1995). A more recent area of scholarship investigates not scientists but university honors graduates in STEM fields (science, technology, engineering and math) to find that these students are far more likely than the average American to have arts and crafts backgrounds, and that their arts participation is significantly correlated with measures of creative capital such as patentable inventions and founding new companies in their post collegiate years. Moreover, lifelong, sustained participation is said to yield the most significant impact in terms of enhancing innovativeness and entrepreneurial creativity (LaMore et al. 2013).

Together, these various streams of research constitute a compelling argument that arts and crafts participation, exposure and practice yield a tangible influence on the creative capacity of children, innovators, and society at large; yet there is a gap in our understanding of precisely how this knowledge is used by workers and entrepreneurs and applied in the work setting. Additionally, findings from these studies beg the question of whether or not there is a relationship between arts avocation and the propensity of individual entrepreneurs to promote philanthropic activities targeting the local arts community. Insight into these questions, which are central to this study, may enable arts and crafts programmers and practitioners to design

[1] College Board and the National Merit Scholarship Corporation. (2010) *Total Group Profile Report*. Retrieved from http://professional.collegeboard.com/profdownload/2010-toal-group-profile-report-cbs.pdf

activities in ways that leverage the innovative success of future entrepreneurs in engineering, technology and science, and perhaps encourage them to ”give back” so such programming can be sustained.

Another area that has not been adequately addressed in the literature, yet remains crucial to our understanding of the dynamics of innovation, is the relationship between entrepreneurial success in high growth sectors, on the one hand, and the use of art, design and creative organizational practices, on the other. The physical design of workplace environments is increasingly recognized as a crucial element in enhancing creativity and innovation within entrepreneurial organizations. In his biography of Steve Jobs, for example, Isaacson (2011) notes the importance Jobs placed on the physical layout and design of the headquarters of Pixar in encouraging spontaneous, informal interactions among a diverse set of technologists, artists and writers leading to increased innovation and productivity. Although innovation has been linked to the physical aspects of work environments, little research has been done on the direct relationship of the physical work setting and innovation practices (McCoy 2005), and no comprehensive framework exists in the workplace literature on the construction of creative workplaces.

Moreover, while an influential body of work in geography finds that competitive success in high technology and creative industries like new media is dependent on flexible employment arrangements, temporary collaborative project teams and a high degree of outsourcing (Benner 2002; Grabher 2002; Christopherson 2002; Gereffi et al. 2005), nobody has looked at how these forms of work organization shape innovative economic activity in the form of number of patents established and companies founded. Insight into these questions of precisely how art, design and creative organizational inputs shape tangible economic outputs is critical to our ability to encourage creative productivity in the workplace, and in turn, advance economic prosperity in our communities and regions.

Within this context, the aim of this exploratory research is to examine the particular dimensions of creative capital as cited above, and to address the following specific research questions.

- How do entrepreneurs and innovators apply skills learned through arts training and practice to their professional work (in other words, how do such skills transfer from avocation to production)?
- How and to what extent do these individuals engage and participate in community development and community arts endeavors?
- How do innovators design and organize their work environments in ways that facilitate and encourage creative productivity?

Research Methods

Interview Instrument

In order to address this diverse yet complementary set of questions, the Michigan State University Center for Community and Economic Development in partnership with the MSU College of Arts and Letters, assembled a multi-disciplinary research team consisting of scholars and students in the areas of art, design and economic development to conduct the analysis. Given the project's emphasis on the potential for arts, broadly defined, to stimulate innovative and entrepreneurial activity and advance regional growth, the research garnered widespread interest from the arts establishment, most notably, the Michigan Council of Arts and Cultural Affairs (MCACA). MCACA recognized that the team's research objectives were closely aligned with its own organizational mandate to strengthen arts and culture in order to enhance quality of life in Michigan, and provided support for the project.

The team worked closely under the auspices of an advisory committee, consisting of innovative business founders, representatives of the interior design/office furniture industry, community arts leaders and academics from MSU departments, and designed the empirical analysis to address the above research questions directly. The advisory committee not only provided input at every stage of the research process, but also participated in pilot tests of the survey instrument so that the team could refine the set of questions before officially launching the interview process, provided important insights on the preliminary findings of the research and facilitated the distribution of the research findings.

The research team elected to use an interview survey questionnaire consisting of a series of closed- and open-ended questions that focused on the degree of arts participation and community engagement (both at the individual and company levels) demonstrated by a set of highly innovative private sector companies in the State of Michigan, as well as their organizational practices and workplace design characteristics.

The interview questionnaire consisted of four sections. Each of the three sections included a series of questions to answer each research question, and the last section asked about demographic information. Questions on the first and second research questions are presented in Table 1.

Table 1. Questions for the First and Second Research Questions

How do entrepreneurs and innovators apply skills learned through arts training and practice to their professional work?
• As a child (<15years), what arts and crafts did you learn, practice, and pursue? Please describe. • As a young adult (15 to 25 years), what arts and crafts did you learn, practice, and pursue? Please describe. • As a mature adult (>25 years), what arts and crafts did you learn, practice, and pursue? Please describe. • Based on your response, it looks like you were involved in_____. Tell how you got started/why you continued. • Do you apply anything that you learned from your arts and crafts experiences to your current work? Please explain. • Is participation in arts and crafts essential for an innovator? Would this make a difference in your hiring decisions? • Number of companies you have founded: • Number of licensed patents and inventions you have produced within the last ten years: • Number of pending applications, patents, and inventions you have developed: • Number of copyrights you hold?
How and to what extent do these individuals engage and participate in community development and community arts endeavors?
• Does your company sponsor or contribute to any types of charitable activities? • How involved is your company in the local arts community? In what ways? • Why were these organizations/events selected to receive support? • As an individual, how involved are you or is the CEO / Founder of the company in your arts community? In what ways?

The section for the third research question included two parts: The first part asked about the company's organizational management strategies, especially on flexibility. The second part focused on the physical work environment to assess the workplace design strategies in facilitating organizational creative productivity. As a means to gain insight into the importance of different workplace environments in the innovative, entrepreneurial process, the team incorporated a novel visual component for the physical work environment, providing an original methodological contribution. The characteristics of an innovative workplace, both its organizational and design dimensions, have been well documented in the literature, and the content of the survey drew directly on these literatures. Review of the workplace design and work environment theory, for instance, led to the development of seven categories of attributes commonly associated with creative workplaces, called Seven Creative Workplace Attributes (Lee, 2012). These included 1) *Disengaged Space* for play activities, mental breaks, or social interaction (Horgen, 1999; Heinonen and Hiltunen, 2012; Vyas, nd; Bolton, 2009); 2) *Doodle Space* for generating ideas including formal or informal meetings (Heinonen and Hiltunen, 2012; Oldham and Fried, 1987; Streitz, 1999; Heerwagen et al, 2004; Annunziato 1999); 3) *Unusual, Fun Atmosphere / Ambience* through the use of design or craft work or unusual architectural or decorative elements (Oldham and Fried, 1987); 4) *Relaxing Environment* which could include natural elements or home-like settings (Welch, 1996; Croome-Gale, 1999; Smith, 1978; McShane 1997; Sykes, 2012); 5) *Stimulation of Senses* such as smell, music or sound and accentuated colors (Hyatt, 2005; Croome-Gale, 1999); 6) *Technology Interfaces for Collaboration* including manual and low tech tools and electronic and high tech equipment (Welch, 1996; Heinonen and Hiltunen, 2012); and finally, 7) *Balanced Layout between Work Modes* that supports a variety of work modes, including both collaborative and individual focus spaces (Gensler, 2013; Parkin, Austin, Pinder, Baguley, and Allenby, 2011; Sailer, 2011). See Appendix A for visual survey examples.

Rather than simply describing each of these spaces orally to the research participant, as in conventional questionnaire practice, the team elected to use photo elicitation methodology to draw information that might not otherwise be gained through verbal interviews alone (Lazet, 2013). Photo elicitation analyzes informants' responses to images and the social and personal

meanings and values they attach to them (Bignante, 2010). This method is also commonly used to examine designed objects or spaces in design related fields when visuals are a critical component to the research. Interviewees were presented with high-resolution color images of each of the seven spaces with the use of an iPad or laptop screen. The overall objective of the photo survey was to promote a more intuitive, reflective and engaged response from interviewees regarding the nuanced differences between individual spaces, and to allow for a deeper, more personal understanding of each environment and how spatial characteristics shape innovative outcomes in the workplace. Table 2 shows the questions used to assess the company's organizational management strategies as well as the seven categories of spatial characteristics to assess workplace design strategies.

Table 2. Questions for the Third Research Question

Part 1: How innovators organize their work environments in ways that facilitate and encourage creative productivity
▪ To what degree do you provide individual flexibility in this company? Please explain. ▪ Do your employees participate in collaborative, team-based work ▪ If so, what percentage of their work is team-based? What is the composition of the team (i.e., other firm members, clients, occupational mix)? What are the advantages / disadvantages of working like this? ▪ To what extent does the firm rely on temporary independent contracting, outsourcing, or subcontracting of functions? ▪ Any additional thing about your company's workforce and workplace flexibility?
Part 2: How innovators design their work environments in ways that facilitate and encourage creative productivity
▪ Does your site have this type of Disengaged Space? ▪ Does your site have this type of Doodle Spaces? ▪ Does your site have this type of Unusual/Fun Atmosphere? ▪ Does your site have this type of Relaxing Environment Space? ▪ Does your site have this type of Element for Stimulating Senses? ▪ Does your site have this type of Technology Interface Tools for Collaboration? ▪ Does your site have this type of Spatially Balanced Layout? ▪ Which one is the most important for creativity and productivity?

Sample and Data Gathering

The initial sample was derived from the 2006 "21st Century Jobs Fund" awardees, an elite group of 62 businesses within manufacturing, alternative energy, life sciences and defense,

recognized by the Michigan Economic Development Corporation (MEDC) as innovative, high skill and high wage organizations. These companies are precisely the profile of firms that MEDC seeks to attract, support and retain in order to be competitive in the global knowledge economy. All companies were contacted at least three times by team members via email or phone and invited to participate in the survey, and if they did not respond, the source was considered exhausted. The goal was to conduct the survey in-person at the interviewee's place of work, if possible, or alternatively, over the phone if a face-to-face interview could not be arranged. At the outset, the objective was to get a response rate of 50% from the 21st Century Grant population. However, only 28 of the companies agreed to be surveyed. In order to supplement the population to obtain a sample size greater than 30, which would justify parametric statistical analysis, the research team also contacted the winners of the 2012 "Accelerate Michigan" Business competition. This set of innovative Michigan companies has also been deemed by MEDC and a network of business incubators, universities and partners to be the "best and brightest" entrepreneurial firms at the mid-to-late seed entrepreneurial stage, in a wide range of sectors. In the end, 31 surveys were completed drawing on both groups of innovative, high skill, high wage firms.

In the following discussion, information from the survey is presented in tabular format with selected comments provided by respondents to highlight key findings. As will become apparent, however, its interpretation is frequently assisted by the use of qualitative information gleaned from the interviews with CEOs and other senior managers. We begin by providing a summary of overall characteristics of survey participants and then address the three research questions and the findings from our study.

Findings

Characteristics of Survey Respondents

There was a great deal of variability in the age and size of the companies interviewed in the sample population. Two of the companies were only three years old, and the oldest firm was formed 150 years ago. The median company age was ten years. In annual income, the firms

ranged from $21,000 to $34,900,000, with a median annual income of just over two million dollars. The companies were generally small in size, with a median number of 10 employees, although the range was from one to 1,750 employees.

In this research, we tried to interview the founder of the company, and were successful in the preponderance of cases; for 26 of the companies, we were able to interview the founder or CEO of the firm. When this was not possible, the vice-president or other senior official was interviewed. Forty-seven percent of those interviewed had a doctoral degree or equivalent, and another 40% had masters degrees. Twenty-one had degrees in sciences or engineering, and ten were business majors. Ninety percent were white males, with one South Asian woman, one white woman, and one South Asian male. Only one respondent was less than 35 years of age, and 84% were 55 years or older.

How do innovators and entrepreneurs apply skills learned through arts and crafts training and practice to their own professional work?

Our assessment of the ways in which entrepreneurs apply their arts skill to their current work focused on the extent to which these individuals participated in arts and crafts practice throughout their lives, the degree to which they apply that knowledge on a daily basis in their work environments, and whether or not they feel such a background is essential to be successful as an innovator. While, unlike previous studies (LaMore et al. 2013), we find no statistically significant relationship between arts participation throughout life and innovativeness at the career stage, our findings show a high overall degree of arts and crafts involvement in our sample of CEOs, with 42% of respondents reporting lifelong practice in activities ranging from music lessons to woodworking, model making, photography, writing, dancing, and design work.

Information from our interviews reveals precisely how innovators benefit from their prior avocations in their day-to-day work. One respondent with a vibrant background in music and graphic arts as a child sees a direct link between the two and says that,

> I use [art] every day because being creative makes me successful in my business. I studied math and physics but the reason I have a doctorate

> degree and am able to invent scientific products is because I have an arts background.

Another CEO highlights how a background in photography strongly shapes his ability to direct ad layouts and do web design, and one interviewee links his model making to his product design skills. According to him, "Doing model cars was a creative process for me. It does directly translate into what I've done on the product aspect of each of the companies [I've founded]." One manager makes a connection between arts and crafts practice and creativity, stating, "Any innovator needs a generous amount of creativity to think ahead of everybody. If you do not have an imagination, you cannot be a visionary." In another example, the art of writing at a young age has strongly impacted the professional success of one CEO who claims that you need to be artistic in order to be a good scientist, and says,

> When I started in the company, [my writing] helped me in unlimited ways. I love writing the scientific reports. It helped me write the business plan, it helped me write the white technical papers. Science, business, everything - [my writing] has helped me.

An interviewee with a strong background in many types of arts such as theatre, sketching, drawing and "building things" is convinced that the skills he honed as a child carry over into his day-to-day engineering work. He concludes,

> I'm not a mechanical engineer, I'm a civil engineer, yet I designed manufacturing equipment. A lot of that knowledge came from me taking things apart and putting them together and trying to figure out how to make things.

Another respondent argues that a background in arts enables one to see complexity, or “grey between the black and white” and contends that "When you have someone that goes through a fine arts education, they deal with ambiguity better than somebody who goes through an engineering school," a significant asset in creative problem solving and day-to-day operations. Not only do nearly half of our research participants show a sustained level of arts and crafts participation throughout their lives, 39% believe that such a background is essential to success as an innovator, and another 39% suggest that it would also influence their hiring decisions. Referring back to our interviewee who made model cars as a child and young adult, when

choosing skilled candidates to hire for his company, he readily seeks traits in individuals that he personally honed through his previous arts and crafts practice. He says,

> I used to build toy models and... cars. I've done that my whole life. My own assessment of creative people, or at least very good technical designers, are people who take a lot of things apart. And maybe put them back together. Whenever I look for a product designer, that's a common trait I look for.

Along similar lines, another innovator sees great value in hiring scientists with a background in design, "As a start-up, we want people who can wear multiple hats. We are not just scientists. A mechanical engineer who has design skills? Oh my God, that person is so important to us." One CEO recognizes the far-reaching impact that these candidates may have on the business practices of an organization. He notes, "It would be a huge positive to have [arts experience] in a potential employee's background... I think people who have an interest in those specific areas are better able to interact with others in a positive way... that generates good business practice." In another example, the interviewee is often more interested in creative thinking than technical skills in potential candidates and says "Obviously if you don't have the tech skills you don't get the job, but the differentiator is your ability to problem solve and the arts helps creativity a lot."

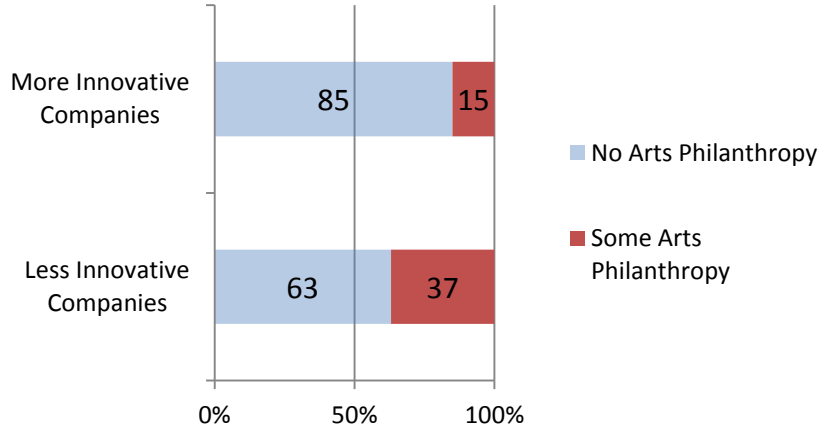
How and to what extent do innovators and entrepreneurs engage and participate in community development and community arts endeavors?

The analysis of community support and engagement investigated the extent to which innovative companies in our sample population sponsor community charitable activities, both arts related and nonarts related. As previously indicated, we also differentiated this by individual- and company-level involvement. Given that over 40% of the innovators have lifelong arts participation, we expected to see a fairly high degree of community arts philanthropy and support. Our results, on the contrary, show that the opposite is true. That is to say, highly innovative companies (defined as those that hold ten or more patents and / or copyrights) are significantly less likely to contribute to and support local community and arts endeavors than

their less innovative counterparts (defined as those firms with less than ten patents and / or copyrights).

Through our interviews, we were able to discern an overall pattern indicating why certain companies have a stronger propensity to participate in community charitable and related activities than others. In general, older, more mature and established companies demonstrate a higher degree of community commitment than do younger firms, particularly those at the seed, start-up and high growth phase of their life cycle. For instance, the oldest company in our sample, a service products firm founded in 1863, reported that it contributes extensively to a wide array of local charities in order to enhance development in the communities it serves. The firm targets seven major areas for funding, including substantial funding for the arts. The CEO noted that, personally, he was very involved in the local arts scene as well, sitting on several boards of culture and arts institutions and encouraging his fellow managers to do the same. As he puts it, this approach simply "makes good business sense" given the firm's efforts to project a positive public image and attract and retain a highly skilled workforce. Similarly, an agricultural products firm that is over sixty years old is another ardent supporter of local charities and religious organizations in its community.

Figure 1: Percent of highly innovative companies and less innovative companies contributing to local community and arts organizations



By contrast, the younger companies in our population reported a lower overall level of community support and engagement. When asked about the philanthropic activities of his

organization, one CEO of a pharmaceutical sales firm founded in 2006 indicated that he was limited in the types of activities he was able to engage in due to the funding structure of the company. He says, "We're funded by grants so we can't technically fund anything like that." This resonates with findings from a number of other early stage firms. Although several interviewees remarked that they were enthusiastic consumers of local arts and cultural activities, most respondents had neither the time to devote to supporting other organizations, given the demands of growing their own businesses, nor the financial means to commit to activities beyond their immediate day-to-day operations. As the CEO of a specialty materials company established in 1996 points out, "For the types of start-ups that I deal with, which are very early stage ones, the CEO's biggest concern is 'will I make payroll next month?' It's literally that." Another suggests that it is not appropriate for companies to make investments that do not show an immediate return, particularly if dependent upon venture capital funding, and reports "Just to be really blunt, until a business is cash flow positive, everything that you have you are using and then some. And so to put it out to art where you get zero return on it from a business perspective is just not viable." Yet we also noted some exceptions whereby, despite limited resources, companies felt emotionally compelled at times to donate to particular charities and causes. The CEO of a three-year old cancer diagnostic company which recently supported a water filter project in Haiti notes,

> We were very proud of it, because as a start-up, we don't have too much money ourselves. But individually, we put together a little fund to give out water filters in Haiti... We felt deeply about the Haiti people when the earthquake came... we believe in action, so that's where we contributed.

While there is a low level of community and arts involvement on the part of innovative firms, our research reveals what we have termed a "*gLocal Paradox*." A *gLocal Paradox* is the phenomenon of limited connectivity of global enterprises to a local community, which can be observed in such factors as their level of local charitable giving, civic engagement and place attachment. It is paradoxical in the sense that while an innovator's own lifetime exposure to and participation in the arts and cultural activities is high, their commitment to supporting the arts and cultural institutions of a local community is limited. Our findings may be explained, in

part, by the globally integrated web of competition in which innovators are embedded resulting in a relatively low level of involvement in social and civic connectedness in local communities. This aligns with Putnam's view (1995) that there is an overall decline in social capital and civil society in America, a phenomenon that he attributes to enhanced social and geographic mobility, the weakened importance of families and the technological transformation of leisure. Our work points to the fact that the increasingly globalized and geographically distributed nature of value chains and production networks in the contemporary economy has exacerbated the issue, as entrepreneurs who at one time focused their attention on ”the local” are now far more concerned with “the global” as the predominant space in which they work.

Our research highlights the untapped potential and the exciting opportunities that these wealth-generating companies may hold as future community benefactors and philanthropists. However, such potential may be reached only through careful, long-term, thoughtful engagement and relationship building on the part of local arts and community organizations. Such a strategic approach may counter the tendency for innovators and entrepreneurs to negate the local and encourage them instead to support organizations that enhance quality of life where they live.

How do innovators design and organize their work environments in ways that might facilitate and encourage creative productivity?

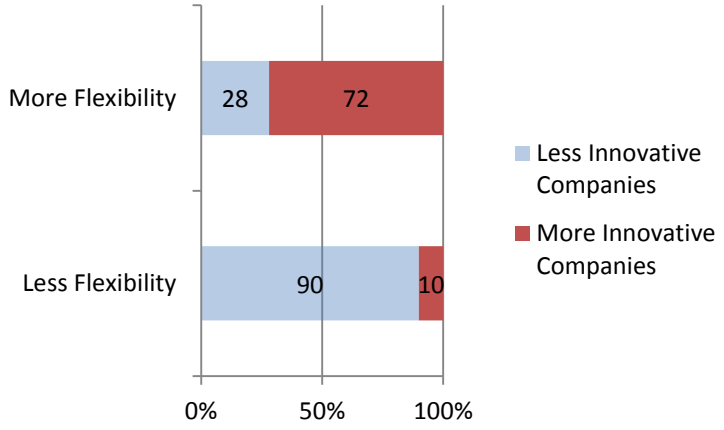
Our investigation of workplace organizational and design characteristics involved questions about the degree of employee flexibility (i.e., the option of flextime, part-time and opportunities to work from home) and collaborative, team-oriented approaches, and the advantages and disadvantages of these practices. We also conducted a detailed survey of workplace design characteristics based on our seven-point analytical framework inquiring about the presence of the following types of spaces: disengaged, doodle, fun, relaxing, stimulating, technology and balanced layouts, and gauged the degree to which particular spaces are important to creativity and productivity.

We find a significant relationship between degree of flexibility in the workplace and level of innovativeness and creative capital, as measured by number of patents and copyrights

produced. In other words, more innovative companies in our sample population (as defined by those with more than ten patents and copyrights) are significantly more likely to adopt flexible work practices that provide employees the option of flextime, the ability to work from home and part-time work, than less innovative firms.

Our interviews enabled us to discern precisely why organizational flexibility is so crucial to innovativeness in high growth sectors in the contemporary economy. When asked if flexibility is important, one entrepreneur says "Absolutely, that's the nature of a virtual company. Often our employees will work around the clock, some of them at two in the morning, and those same people at two in the afternoon might be at the beach." According to a number of start-up CEOs, flexibility is absolutely vital at the early phase of development because employees must be willing to take on multiple roles and move beyond their specific area of expertise, depending on the stage of the project, and is key to young companies that may lack resources and have less structured organizational procedure and hierarchy. So too, it remains vital at a later stage of development. For example, one respondent from a 17-year old specialty materials company emphasized the critical importance of flexible practices in the technology sector in order to attract and retain high skilled, self-directed, trustworthy employees who can achieve tasks at a high level and on time. Another respondent indicates,

Figure 2: Percent of reported flexibility in the workplace of highly innovative and less innovative companies



> Any time you have flexibility, you have a greater possibility to adapt to change, and therefore, a better chance to succeed. In an industry where everything is changing and you have innovation, you can't really mandate it from the top. If you have a culture that tries to do that, it will stifle innovation.

One CEO discussed the importance of such practices, irrespective of business maturation stage, to accommodating the distinct needs of women. In her words,

> We are two women [of three cofounders] who started the company. We know how it feels to have flextime. When I started, I was pregnant and I worked for five months from home and I could still put in a lot of valuable time to my company.

Our results also indicate that flexibility is not a practice that is adopted solely by young science and technology companies at the seed, start-up and high growth phases of development, but also by large, established, and highly complex organizations in a variety of sectors. The CEO of a specialty service company with over 1700 employees and founded in 1863, for instance, tells us that by offering the option of flextime, working from home and part-time work to his workers, his company can achieve its two core goals: to "create superb products and have contented employees." Although the degree of individual flexibility that is supported is often dependent on the nature of the position, he attributes the company's long-term innovative success to its ability to meet not only market demand, but also the flexibility needs of skilled employees. After all, new and valuable ideas do not come out of nowhere. Google[2], for example, provides its employees 20% of their time to spend on innovation projects outside their core job duties. In fact, 50% of Google's innovation in the second half of 2005 came from this 20% time (Martens 2011), suggesting that flexible employment conditions and the freedom for skilled workers to transcend conventional employment arrangements and explore ideas and opportunities constitute a critical component of innovation in the contemporary workplace.

We also observed some notable exceptions and limitations to the extent to which some managers are willing to allow their staff flextime and the ability to work from home. The founder and CEO of an innovative engineering company producing reinforced concrete suggests that such practices can be abused, which may lead to decreased productivity. He says "I'm a little cautious. I support it occasionally, but it has a short leash. I find that there are too many distractions at home and I've experienced what happens when people are too liberal with that

[2] Google was not in our research population.

policy." Likewise, one defense technology company prefers to have workers on site. As the CEO respondent puts it, "We have a philosophy where we try to have people work in the workspace. I'm a firm believer that there's a kind of synergy you don't get when you are remote." This points to the importance of face-to-face interaction in creating the conditions that enhance collaborative practices, innovation and creative productivity in the work environment, which presumably varies based on sector, occupation, and the nature of the product or service development process.

In fact, the degree of collaborative, team-oriented practices, both inside the firm and with external partners, was the focus for the next set of survey questions. We do not find a significant relationship between collaboration and innovativeness mainly because collaborative practices are so widespread in our survey sample and are employed by virtually all firms, both less innovative and highly innovative alike. Many of our interviewees spoke about the necessity of adopting these practices as a means by which to tap into and benefit from an occupational mix of people with different areas of specialized expertise. Collaboration through teamwork was often identified as crucial to creating value-added for the company, and many interviewees suggested that firms incur less cost and achieve a more innovative product in the long run through such approaches. According to one company CEO,

> We have a very diverse product. You have not only software; you have hardware design, electronics design, and algorithms that get developed. And all of those things interact to make a system. So it's critical for this group to work collaboratively as a team.

Moreover, many pointed to the necessity to reach beyond the confines of the firm in order to obtain specialized skill sets, inputs and knowledge bases from external innovation partners such as consultants and customers. The CEO of a medical device firm says that:

> Very often we co-develop products, so we hire consultants or people from outside to assist with products. Our product is used in conjunction with a lot of other types of products that are in the operating room so we work with different companies to integrate these products together, as well as our customers. We're often modifying, changing and designing during product validation so there's lots of customer feedback on product use and new ideas for improvement.

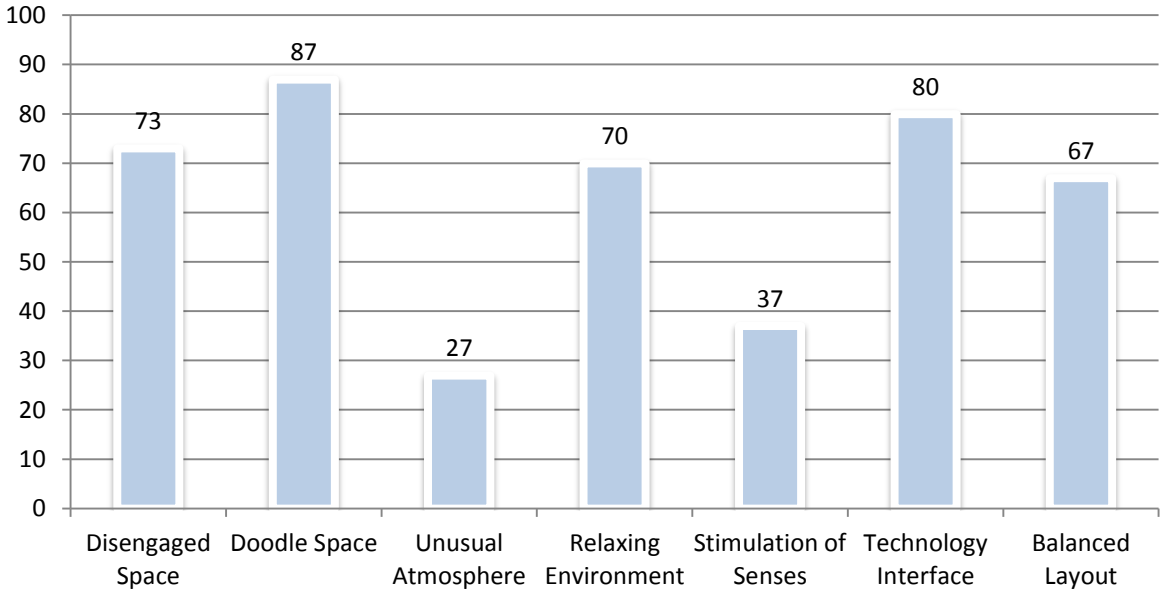
Findings from our research therefore support core ideas in the literature in geography which says that innovative work in creative and high-tech industries in the contemporary economy embodies a diversity of specialized technical and artistic skills that are needed to accomplish complex tasks, and therefore often defies conventional employment arrangements and modes of work organization (Grabher 2002; Benner 2002). Such flexible, interactive, collaborative conditions, both inside the firm and beyond its boundaries, are fundamental to the very nature of competition within these industries in an era of intensified global competition and the drive for rapid change, continual innovation, and product development ahead of competitors.

Our next set of survey questions was structured to gauge how innovative firms utilize workplace design strategies as a mechanism to encourage and facilitate creative productivity in their work environments. We asked our survey participants about the presence of seven types of spatial characteristics in their office environments (refer to Methods for a description of each). The results seem to suggest that the investment decision on the physical work environments is related to the financial capacity and maturity of an organization, following the organizational life cycle. According to the study, the large established organizations invested on all seven spatial attributes in their physical work environments while most start-up companies have a handful of these features.

The most common spaces observed were Doodle Space (87%), Technology Interface for Collaboration (80%), and Disengaged Space (73%). Two-thirds of companies also indicated that they had Relaxing Environment (70%) and Balanced Layout between Work Modes (67%). Figure 3 presents the overall frequency distribution between the seven attributes. While many companies interviewed in the study had various aspects of the Seven Creative Workplace Attributes in their facilities, we did not observe any statistically significant relationship between the presence of these work environments and company innovativeness as measured by number of patents and copyrights in our present study. This may be attributed to the diversity of the companies studied based on the number of employees, amount of revenue generation, and stage of organizational life cycle. In fact, many participants were start-up companies who

were yet in the early stage of the organizational life cycle and did not have enough financial capacity to invest on the physical work environments. However, it is important to note that five of the seven workplace attributes were reported by at least two thirds of the companies surveyed.

Figure 3: Percent of companies reporting having each of the seven creative workplace attributes



When asked which space was the most important space for creativity and productivity, 31% of participants identified Doodle Spaces and 34% identified Technology Interface for Collaboration as the most important spaces. In addition, a number of respondents cited the social and interactive spaces as key to encouraging those serendipitous encounters and face-to-face interactions said to promote creativity and innovation in the workplace. “Serendipitous interaction” is known to be a crucial component to the workplace design of highly successful tech firms, and has been strategically implemented to such highly innovative places as Google and Facebook (Henn, 2013). Google is especially known to spend a substantial amount of time analyzing the components of workplace innovation, and has implemented workplace design strategies focusing on providing spaces similar to Disengaged Space, Unusual/fun Atmosphere/Ambience and Relaxing Environment. Others suggested it was a combination of

environments that fosters overall productivity. For example, one CEO says, "Being able to focus at times, collaborate at times, and relax at times - a triangle of conditions that allow you to be highly productive." Speaking about the importance of workplace design in fostering a positive public image, one interviewee claims that:

> Our current space has a large and small conference room, both well appointed - we put money into those. At the time, we were starting growth and I was trying to position for an exit. I anticipated that we needed more, a better look and feel and more curb appeal so when potential partners come on site, they would look around and say: 'Wow this looks like a high tech company full of high quality people.'

Likewise, the work environment is key to attracting and retaining skilled workers, as the above respondent points out, "Our effort [was] towards a work environment that would keep people happy and make them proud and feel good about being part of the company." Here, the creative work environment is not only a mechanism to promote employee creativity, but also a representation of worker identity, and the office a reflection of the creative organization. This is a phenomenon that began in the office environments of more established and high performing firms in the creative and high-tech industries, and has since become a part of the mainstream, as banks and more traditional sectors have joined the trend of investing heavily in workplace design to support worker creativity and productivity.

On the other hand, despite this data highlighting the importance of the physical characteristics of the workplace in promoting innovativeness and a positive public image, the current study reveals a slight gap in the physical work environments between Michigan's smaller start-up companies and more established firms. The study overall exhibited a lack of strategic investment in design on the part of the majority of firms in our sample population. Upon reviewing the sample visuals of our seven spaces, one respondent replied,

> I don't think people have the money or interest in spending money on this. Workplace here is extremely traditional... I can't imagine most start-ups would have any of this. In general, the start-ups based in Michigan are in terrible condition. You just have enough money to survive and you're going to buy furniture that's 30 years old.

Along similar lines, another CEO responded with the following comments,

> Do we have pretty paintings on the wall? That doesn't even hit the radar screen at those early stages. With the early stage stuff, it's blocking and tackling, it's just very basic, it's 'let's do this and get it done.' And it's the work that's providing the stimulation, not the workspace.

Our research therefore shows that enhancing the physical work environment to support employee creativity is often pursued by established companies rather than those at the seed, start-up and high growth phases of their development. On the contrary, start-up companies tend to focus on providing an environment that meets minimum requirements to prevent the loss of productivity and are not yet able to focus on "enhancing" innovativeness and creativity among their workers. However, as noted by a CEO of a company who participated in the study, when the life cycle of an organization becomes mature, and recruitment and retention of talented individuals become critical to the success of the organization, the physical work environment is vital to the further growth of the organization. An enhanced work environment will not only attract talented individuals but also enable those individually to excel at continuously producing creative and innovative ideas.

Conclusion

This paper began by making a number of observations linking art and workplace to innovation. There is an association between a place's artistic, cultural and creative assets, including the presence of highly skilled creative workers, to economic development, innovativeness and regional growth, according to a widespread literature in economic geography. In a related vein, the propensity of individuals to pursue and practice artistic activities at a young age is shown to play a critical role in both academic performance in school and innovativeness and economic success at the career stage. Moreover, sustained arts participation throughout the course of one's life in some cases seems to yield economic benefits. We were motivated to extend our understanding of the multi-dimensional relationship between arts and innovation by addressing three specific questions in our study. First, how do entrepreneurs and innovators apply skills learned through arts training and practice to their professional work? Second, how and to what extent do these individuals engage and participate in community development and community

arts endeavors? And finally, how do innovators design and organize their work environments in ways that facilitate and encourage creative productivity? We survey a sample of innovative, high growth, high wage firms throughout Michigan in order to address these questions.

Our findings reveal that over 40% of innovators in our study report lifelong arts and crafts participation, with many others beginning as children yet ceasing such activities as they get older, and the majority directly applying knowledge acquired from prior practice to their day-to-day work. Moreover, many participants, just under 40%, concur that an arts background is essential to an innovator, and the same percentage suggest it would actually influence their hiring decisions.

However, when it comes to arts and community engagement, our work shows that the more innovative the company, the greater its propensity NOT to invest in and support local arts and community organizations, with younger start-ups the least likely to invest, given limited resources and a lack of guaranteed return on investment. We have termed this phenomenon *gLocal Paradox* which implies a limited connectivity of these so-called globally connected companies to their local communities. We see this as an untapped opportunity for arts and community organizations to enhance their visibility among this population and to reach out to these wealth-generating companies over the course of the long-term.

In terms of organizational management characteristics on flexibility, our research finds a significant relationship between flexibility in employment practices and innovativeness among high growth firms, both start-ups and more mature companies alike. While many firm CEOs are strong proponents of an unlimited degree of flexibility among their labor force, including flextime, part time and the ability to work from home, others are more cautious, suggesting that such practices can reduce both productivity and innovation. In a similar vein, companies demonstrate a high degree of team and collaborative work, oftentimes engaging suppliers, customers and other external nonfirm actors in the product development and innovation processes. In the area of physical work environmental characteristics, some companies in our sample invest heavily in their physical work environments, yet these tend to be larger, more

established firms rather than start-ups. Once companies mature, however, workspace becomes increasingly important in attracting and retaining talent and enhancing creative and innovative productivity. However, five of the seven workplace attributes were reported by at least two thirds of the companies surveyed. These five attributes are Doodle Space, Technology Interface for Collaboration, Disengage Space, Relaxing Environment, and Balanced Layout between Work Modes.

While the study provides an insightful snapshot of the practices of innovative companies in Michigan regarding their support for arts, labor relations strategy, and investment in work environments, there are a number of limitations to note. Given the variety of firms and sectors represented in our population, one limitation is our choice of a suitable measure of innovativeness and creative productivity. We used number of patents, trademarks and companies founded; however, while these may be appropriate for certain firms, others may not necessarily patent nor trademark their innovations. The rate of patents over a given time period may be more suitable in certain cases than the sum total of patents, whereas for other companies, more accurate indicators might be an (unpatented) product innovation, process innovation or trade secret. Another metric that might be considered is the amount of venture capital and angel funding (although it may be difficult to compile data on this).

Another limitation is that the sample size may be too small to generalize the findings. The relatively small sample size and the great diversity in companies made it impossible to control for all the variables that could be related to entrepreneurial creativity in addition to workplace design, factors such as size, revenue generation and life cycle stage of company.

Finally, while the research team found some success in using photo elicitation as a research method, there was also some concern that this method may have not allowed for respondents to accurately determine if in fact their specific context was represented in the sample photos. The research team advises that additional research in the limits of this methodology be conducted to increase the accuracy of a photo elicitation methodology.

Recommendations

Public policy

Adequate funding for arts and cultural institutions is increasingly recognized as a means of fostering divergent thinking, innovation, and the skills needed within the twenty-first century workplace. Innovators interviewed in this study reported a high degree of arts and crafts exposure and expressed the belief that this background was an essential contributing factor in their entrepreneurial success as well as a consideration in their hiring decisions.

Public policy makers are called upon to recognize that funding for arts, crafts and other forms of cultural expression are crucial components within larger strategic frameworks to expand innovative capacities within the entrepreneurial community.

> Let me give you an example. Ann Arbor Spark runs a program for interns in the summer. . . . They take them to the Ann Arbor summer festival and all these things and attempt to convince them that this is a good and fun place to live because that is what the startups and other businesses need. . . . I know that people who go and attend are more likely to stay and we get a better pool of candidates from which to choose.

Arts and cultural community

Respondents in our survey, particularly those who were in the startup or early stage of development, noted their restricted ability to support arts and cultural organizations due to financial and time constraints. Yet, several respondents expressed a desire for increased informal interaction and exchange with individuals in the arts community. Local arts and cultural organizations are encouraged to take the first steps to address what we have termed a *gLocal Paradox* by reaching out in range of ways to early stage companies in their regions. Investing time and effort into establishing these relationships may hold lasting promise for strengthening the bonds between these communities and increasing the likelihood of later mutual support.

> I would say to the arts community that 'let us mingle.' Let science and arts people mingle more, because so many beautiful things can come out of it. You know, we cannot even imagine what can come out. . . . We need more interactions. We need more ideas. We need more creative people coming together. . . . More mixing, more events where both sides can come together and brainstorm.

Arts institutions, councils and individuals within the arts and cultural community may develop ongoing relationships with emerging businesses and sectors of their local economies by:

- Organizing rotating low or no cost art exhibitions for local startup companies who currently have limited resources for display of art work in their workspaces
- Seeking the participation of employees and managers on their boards or community advisory commissions
- Planning periodic informal social gatherings, viewings, or information exchanges with local entrepreneurs

> I think that one of the things that startups have is no money to spend on any type of art or anything for their facility so I think one thing is if the art community reached out and said 'Hey, we have a sculpture.' Or, 'We have something we would like to put in your facility.' If it's free, they are certainly not going to push back and I think what that does is creates a different type of space, gives a different feeling to a space, but additionally, the arts community . . . it's a win-win. Because as a business you can't really spend money on that and as an artist you really want people to look at the things you do. . . . That might be a good opportunity to reach out and say 'Hey can we outfit you with some of the local artists here,' and maybe that's the pathway to the discussion about the charity.

Economic development

Local and regional economic development policymakers who aim to help entrepreneurs and innovators develop and launch successful business ventures using the incubator model should

give close attention to the design, layout and equipping of the physical spaces within their incubator facilities.

Our findings suggest that the most frequent design features found in these innovative companies for facilitating creative exchange and productivity were:

- Formal and informal meeting spaces
- Technology interfaces and spaces for collaboration with external consultants and clients
- Spaces for mental breaks and recharge as well as social hangout.

> I can tell you how you don't do it [referring to an incubator in Southeast Michigan] which is by far the worst incubator facility of all, because everybody is in their own little office and the way the offices are set, their backs are to the door. And it just doesn't work. You get none of that cross breeding, that cross pollination.

In conclusion, while this study seems to confirm aspects of previous research on the relationships between arts and innovation, it raises new questions and insights on creative work environments and linkages of emerging global companies to the arts and cultural community. The 21st century will present a number of challenges to economic development professionals and members of the arts and cultural community as each seeks to provide an environment in which creativity and innovation may survive and thrive. As this research suggests, we may be more successful if we work together to achieve that common goal.

Appendix A: Seven Creative Workplace Attributes

Disengage Space

(Courtesy of Sharon Risedorph Photography/STUDIOS Architecture)

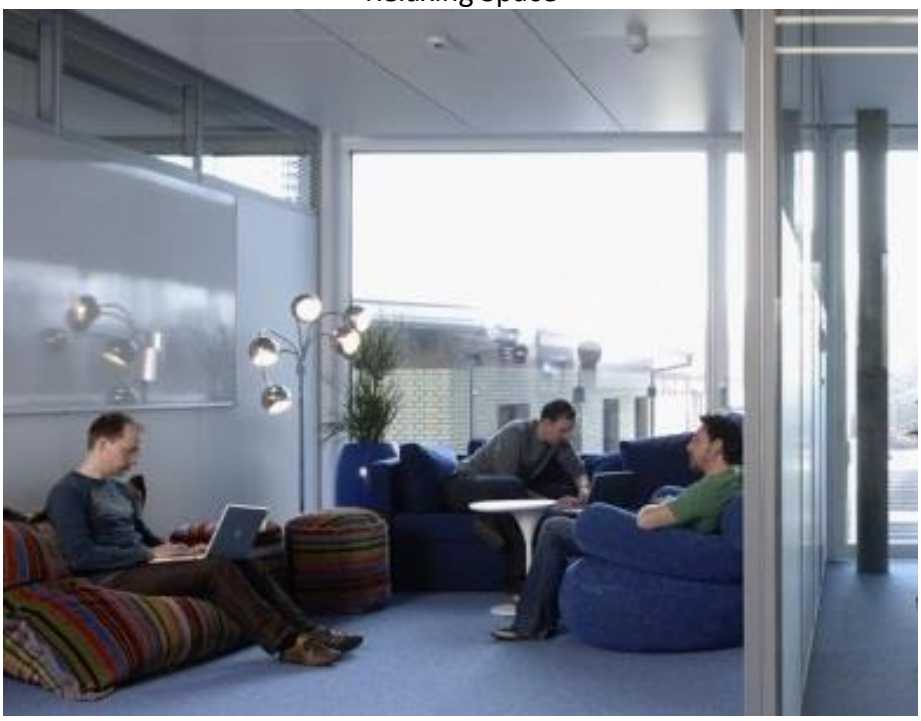
Doodle Space

(Courtesy of Jasper Sanidad)

Unusual/Fun Atmosphere Space

(Courtesy of Stefan Camenzind)

Relaxing Space



(Courtesy of Stefan Carmanzind)

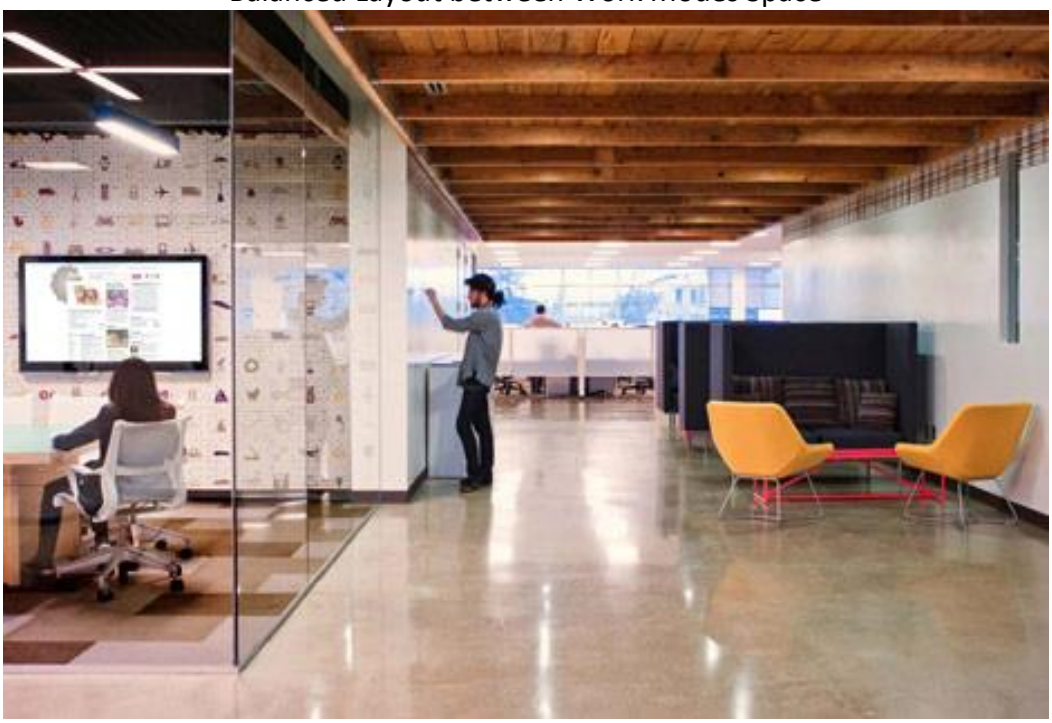
Stimulating Senses Space

(Courtesy of Rachel Harrison)

Technology Interface for Collaboration Space

(Courtesy of Ziba)

Balanced Layout between Work Modes Space



(Courtesy of Jasper Sanidad)

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This project was made possible with support from the Michigan Council for Arts and Cultural Affairs Service to the Field Grant Program

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