Creating Collaborative Spaces at the University of Arizona: Ways to Encourage Interdisciplinary Research and Ideas

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Abstract

This case study examined the potential of creating collaborative co-working spaces at the University of Arizona. Through qualitative research on the effectiveness of co-working spaces already in place at three different universities across the nation, this study identified key features that could successfully be implemented at the University of Arizona. These features were a co-working space built around a student organization centered on collaboration and innovation. The latest in technological resources to aid in project execution and learning. Lastly, a partnership with a local makerspace providing students of all backgrounds and interests to collaboratively work on building physical items in a space they might not have had previous access to. While research was limited to university affiliated websites and articles on co-working spaces, scholarly articles on this specific subject where not found to further back conclusive findings and recommendations.

Introduction

In today's fast passed world, students are looking for places where they can maximize their efficiency within their Universities, through collaborative engagement with diverse groups of people, technology, and industry leaders acting as mentors to help guide them on their way into the professional world. These spaces are designed specifically to encourage collaborative interaction through the use of technology, flexible/reconfigurable rooms, and other viable resources that allow for the flow of collaborative communication between individuals.

The University of Arizona lacks a "co-working" space and this study looks to examine the ways in which the University of Arizona can implement co-working spaces onto campus and identify possible features necessary in order to facilitate an atmosphere of collaboration and innovation. This study seeks to answer the following research questions:

1. How are Universities implementing co-working spaces into their campuses?
2. What are some of the specific features they use in maintaining a collaborative environment?
3. Which of these features would be best suited for implementation by the University of Arizona?

This study looked to three different Universities that currently operate different forms of co-working spaces and identified how those systems worked and what key features they have that the U of A could use in its implementation of a co-working space. The scope of the study focused on the following Universities: North Carolina State University, Stanford, and Arizona State University. Relevant articles, research papers, and theories on co-working spaces were relied upon for the history and implementation of co-working spaces in both professional and academic realms. Dedicated websites and articles for each study site: Hunt Library, StartX, and

ASU Chandler Innovation Center, were used for factual and relevant information on these Universities co-working spaces and features within. Data obtained throughout the research phase were presented as qualitative data and of the authors' opinion alone. Due to the expansive nature and relatively new trend of intentional co-working spaces this paper was limited to only these tree study sites while a more comprehensive evaluation of all University co-working spaces would be ideal, time constraints limited scope of research.

Co-working spaces can occupy almost any area where there is sufficient space to have a couple desks and chairs. The idea of co-working space is that it needs to be a shared space, flexible in configuration, and free of a hierarchical structure. In taking a quote for the man who coined the term "co-working" relative to special design, Berenard de Koven, was looking for a word that would suffice for "working together as equals". He noticed that people don't work together as equals, especially not in the business world where they are graded and isolated, categorized and shuffled into hierarchy that separates them by rank and salary level. Such environments create, for the majority of employees, an indelibly competitive relationship which, even when they find themselves members of the same team, is life with distrust, duplicity and often down right sabotage (Koven 2015). Koven envisioned a space designed to allow people to work together as a whole and share different perspectives, but separately as individuals and individual projects. This model is essential in order to facilitate collaborative working environments where ideas and perspectives can flow freely from person to person.

Definition of Key Terms

Co-working: an alternative way of working in which independent professionals, telecommuters, and others with workplace flexibility share one working environment, rather than work remotely in separate offices or places. Coworkers don't need to work for the same employer or even know each other to work together in a co-working environment (Pinola 2015).

Co-space: is often a cafe-like collaboration space, gallery, or productivity-enhancing multi-functional space, but it could be an office-like setting or even someone's home or loft. The main idea is that individual workers come together in a shared place to enjoy greater productivity and a sense of community (Pinola 2015).

Literary Review

By looking at co-working through a lens of sustainability, we can better understand how it functions within our economy and how it contributes to a sustainable economy. Sustainability is best understood by identifying its three foundational pillars: Social, Environmental, and Economic. Social sustainability looks to the needs of an individual or group and finding equality for each as we progress as a society. Environmental sustainability identifies the functional ecosystems of our planet and looks to not only maintain these systems, but to repair damaged caused by humans for future generations. Economic sustainability strives to promote economic growth through the sustainable allocation of resources and job opportunities for present and future generations. This study will focus on the economic pillar of sustainability and how co-working, as a sustainable practice, is helping to achieve economic sustainability.

Co-working spaces are an integral part of a sustainable economy because they provide a space for collaboration among individuals or groups of different backgrounds and interests to work on projects and build businesses within their communities. Communities that provide low cost office space for individuals looking to start a business that would normally not have the capital to afford a traditional office space, co-working spaces can help stabilize local economies.

In an article by Angel Kwiatkowski, DeskMag.com, identifies that small to mid-sized businesses are the lifeblood of a local economy. They live and work and shop locally (Kwiatkowski, 2012). Freelancers and small businesses that work out of co-working spaces utilize the surrounding small businesses for services like printing, legal, accounting, marketing, and supplies which effectively creates a sustainable loop of money that is spent within the local economy. These spaces can help to facilitate economic sustainability at the most basic and fundamental levels, yet, this was not always the case as the history of co-working started out very different from what it is today.

When looking at the advancements of co-working spaces, it is important to identify the history of working spaces in general, starting with the open space industrial employee floors, to traditional office space, and the cubical that eventually led to the collaborative co-working space. Observation of this progression is important because it identifies how "space" is used to increase employee innovation and effectiveness. Also, how it transitioned from little importance to grave importance as employers understood that with rapidly advancing technology their businesses, and employees, had to keep up to stay relevant in the market place.

The history of co-working spaces can be traced back to the 1920's with Frederick Taylor, an American engineer and, according to Julian van Meel and his book "The European Office: Office Design and National Context", would characterize Taylor who took his structured process of ways to maximize efficiency of industries, but he also implemented those tactics in office settings. His ideas were later used in office design by utilizing a large open floor plan where all the desks were facing the same direction to encourage the flow of work from one desk to the other, leaving out partitioned spaces between staff with only managers having offices (Meel 2000). This style of working, however, was only efficient in streamlining appointed tasks made by managers to workers and didn't encourage the free flow of ideas among the workers. This "hierarchical" style remained the same until the 1960's when Robert Propst, 1960, looked to increase quality of work rather than efficiency. President of Herman Millers Research Corporation, Propst, was able to identify how space plays a key role in office innovation. In a quote pulled form Herman Millers web site, Propst says, "Today's office is a wasteland. It saps the vitality, blocks talent, and frustrates accomplishments. It is the daily scene of unfulfilled intentions and failed effort" (Herman 2015). With this, Miller and Propst released "The Action Office" system which was essentially the modern day cubical system seen in many office and some co-working spaces today. This system basically made any open space into a reconfigurable pattern of 'mobile' offices spaces that allowed companies flexibility in adding, reducing, or reconfiguring the office space to best for their needs while giving employees independent work spaces.

We have seen in these two past examples of people trying to get the most efficiency out of their employees by way of office design. In 1920, Fredrick Tayler tried to maximize employee efficiency by aligning desks side by side in a large open space so work could be passed down readily to the next person, much like a conveyor belt at a manufacturing plant. Propst, however, thought this model was still lacking in spatial creativity and blocks the important factors employees need to perform their best and his design was a 'cubical' system comprised of walls, desks, and other furniture that could also be reconfigured into different locations and shapes. We can see that these two gentlemen see productive work places form opposite sides of the spectrum; one with open space and ordered rows where not much focused work could be completed and the other with each employee in separate 'cubicles' where focus is easy to obtain. It seems both of these models lacked the social connection and engagement needed to spark collaboration on existing or new projects. Co-working spaces seemed to naturally progress to people gathering in coffee shops to work on projects rather than the sterility of offices cubicles and formal meetings. Without other options, people seemed to be limited to coffee shops until other co-working spaces started to pop up.

Co-working spaces can be found springing up in most cities around the United States and are starting to make their appearance on campuses. The fact that they can be located in any location makes them versatile and appealing. Co-working spaces can be in a single room with only a few desks and computers or they can be entire buildings designed to include the different fields of technology, business, and science. The flexibility in design allows them to fit well on university campuses where they would be surrounded by different college disciplines. The magic lies within the design of the space and encourages collaboration and innovation.

Methodology

This study focused on three universities: North Carolina State University's Hunt Library, Stanford's StartX, and Arizona State Universities Chandler Innovation Center or ACIC. Research on relevant articles, associated web pages, and outside sources allowed this study to be able to assess the strengths and weaknesses of each co-working space to determine potential best practices for the University of Arizona. Looking at the different aspects of these co-working spaces we determined which features these programs have in common with one another, features that seem to be foundations to run successful on campus collaboration centers. After identifying the common features among the different programs we set a formal list of three recommendations that could potentially work at the University of Arizona.

In conducting the detailed and in-depth study on the different ways that Universities are trying to build collaborative spaces in order to encourage collaboration and innovation among

University students. It has become apparent that there is no “one size fits all” approach in establishing such facilities on campus and each university needs to assess what their strengths and weaknesses might be. Also, Universities have different colleges that might excel in a particular field so collaborative spaces might need to be tweaked in different ways in order to best serve the needs of the students.

We will be looking the three Universities and the types of collaborative spaces they use or partnerships they have formed with other collaborative space’s that are not associated directly with the Universities. This study will be focusing on:

- Location of the collaborative spaces
- How much support they receive financially
- What type and how much technology they use in their spaces
- How much faculty access they give to non-students, in terms of public use
- Other unique features each collaborative space might that the other Universities do not share

Data and Analysis

Site #1: NCSU James B. Hunt Library

Located in Raleigh N.C., North Carolina State University James B. Hunt Library, opened in 2013, is a remarkable example of collaborative space design, tech power, and forward thinking. Hunt Library is part of the Triangle Research Libraries Network or TRLN which is a partnership between North Carolina State University, Duke University, University of North Carolina at Chapel Hill, and North Carolina Central University. Together this coalition of universities collaborates to form a single effort to further their missions in research, teaching, and education. For the purpose of this paper the focus will be on the Hunt library and how it serves as a co-working space.

The Hunt Library was designed to be a place for student collaboration. Centered within the Centennial Campus Research Park and educational campus the grounds are also open to the public for fishing, recreational use, playgrounds and includes residential grounds, and multiple public park spaces for recreational use. The library itself was constructed at a cost of $115.2 million dollars form donor support and in-state appropriations. The facility is open to all students and faculty from across the University campus, but is centered on students and faculty who are in the science, engineering and textile programs. The library promotes itself as being something transformative, as shown in this excerpt for their web page:

> "A great research library is more than collections, technologies, and comfortable workspaces. A great library inspires—its architecture and technology create spaces that encourage collaboration, reflection, creativity, and awe. At the core of the vision for the Hunt Library is the ability for our students, faculty, and partners to immerse themselves in interactive computing, multimedia creation, and large-scale visualization—tools that are enabling revolutionary ways to see and use information" (James B. Hunt, Jr. Library, 2015).

Within the five story building, the Hunt Library offers a large variety in tech, visualization, configurable spaces, and personal support. Due to the multitude of services they provide, this study will only focus on the features most applicable for a co-working space. The Hunt library offers the latest in visualization, gaming, programing, and computing technologies. The individual and group study space is also made flexible so students can utilize the rooms and reconfigure them easily for other purposes. Students can also get hands on experience in the onsite makerspace, modeling, and prototyping space all with full time faculty to offer help.

Site #2: Stanford, StartX

Located in Stanford California, StartX is non-profit (501c3) student incubator at Stanford University in the center of California's "Silicon Valley", Palo Alto. What originally started as the Stanford Student Enterprises, Cameron Teitelman took over SSE and turned it into StartX which is a, non-profit, student led organization that specializes in student startup companies. StartX's co-working platform is mainly that of an accelerator program that has an application process where at least one member of the applying team must be Stanford affiliated in some way. However, they also take in a few teams that do not have school affiliation allowing for a more diverse co-working community. In a quote from the Stanford news "Community-building and mentorship are a large part of what StartX does. Stanford alumni who have successfully founded companies can receive free office space in exchange for acting as advisors to newer founders" (McClure 2011). In fact community is one of their leading "Core Components" followed by mentorship, education, and resources.

The core components of StartX is what makes it unique among co-working spaces. Michael Chen, StartX volunteer, identifies community as, by far, the most important [core component] with fellow entrepreneurs who are by your side building companies, trust, respect, and confidentiality (StartXVideos 2015). Community seems to be the essential part of their foundation where groups going through the program as in any co-working environment basic components of trust and ease of sharing help facilitate collaboration. Mentoring is another core component, with over 200 serial entrepreneurs, experts, angels, and VCs, including partnerships with other organizations such as LinkedIn, Google, Twitter and many more within the Silicon Valley area (StartX N.D.). Available mentorship in co-working spaces seems to play a vital role in the continued growth for individuals seeking assistance in different areas of interest.

Education takes shape within the organization in the form matching mentors and industry professionals on a per demand occasion, essentially having a rolodex of professionals they can call upon when needed for specific advice. Lastly, they have over $100,000 of technical resources from various partners that include cloud computing and storage credits, developer platforms, and payroll software in addition to drop-in office space and legal advice (StartX N.D.). These foundational features are important in any co-working space as it allows adaptability in changing economic and technological climates. However, being non-profit, the organization does not take any equity in the companies it helps and is supported by the Stanford student government, AOL, and other venture firms (Tam 2011). These funds also physically support Sartx's program with space and resources.

The building they currently occupy is owned by AOL and offers over 3,000 sq ft. of space with an outside area, ground floor commons area, and the second floor has the offices/drop in space for its founders as they go through the program. This support also allows StartX to offer students stipends while they attend their 3 month incubator program. They utilize StartX alumni as mentors which is an integral component of the community environment they are trying to achieve. Being a student led organization, StartX is mainly funded through grants and investor partnerships that are allocated, in large part, by the students themselves. AS 2013 StartX has received a 3.6 million dollar grant from Stanford University and a collective 1.4 million from individual investors such as AT&T, Cisco, and Founder.org to name a few.

Site #3: ASU Chandler Innovation Center

ASU's co-working space is formed through a partnership between ASU, City of Chandler AZ, and Techshop which collectively forms the ASU Chandler Innovation Center or (ACIC). The Chandler Innovation Center is ASU's engineering, research, and technology based education center where degree programs are offered and regular classes are held. Students that attend ACIC's courses in computing, product development, engineering, and entrepreneurship are engaged in a more formal type of co-working where they attend class within the same building which allows for the possibility of co-working interactions. However, the partnership with the for-profit and membership based TechShop is where the strongest potential of collaboration resides.

With eight locations throughout the nation, TechShop made a very profitable business out collaborative spaces. While their focus is mainly centered on developing and prototyping their partnership with the ACIC rounds out an effective collaborative space. The use of the shop is free to ASU students, but they must pay for workshop fees such as materials and equipment certification class that are required to use the tools. In paraphrasing Vice president and dean for entrepreneurship and innovation at ASU, Mitzi Montoya, from an ASU news article "Traditionally, students had to be enrolled in designated engineering or design classes in order to use this state-of-that art equipment, but know we can provide open access tool all the resources for all ASU students" (Brush 2014). In addition, the TecShop has over one million of resources available for member use that include software, tools, and various sorts of other equipment. ASU's partnership with TechShop allows non-student members to collaboratively work with students. This creates a wide range of diversity within the TechShop allowing students and everyday people to work side by side on projects.

Results and Discussion

James B. Hunt Library

Location

The James B. Hunt Library is located at the North Carolina State University, Centennial Campus' Academic Oval, in Raleigh North Carolina. With University 2013 student population of over 34.000 it be considered a smaller university by today's standards.

Support

The Hunt Library is operated by full time university faculty with supporting partners that include: Intel, Dell, VMware, Media Tech, Cicso, and Biamp to name a few of their largest supporters. The library is also part of the Triangle Research Library Network where they can share information, exchange ideas, and work collaboratively as a whole.

Technology

The Hunt Library has the latest advancements in technology available to students and staff. This would include large scale visualization walls of different specification and configurations leaving a variety of potential uses to encourage creativity when dealing with digital media and data. Gaming, Interactive computing, and Programing: NCSU's "Game Lab" acts as their research center and also has an experimental commons area that is open to students, researchers, and faculty to provide collaboration across the game training, education, and design. They also offer a multitude of different spaces that are flexible and reconfigurable to facilitate a wide range of different projects. A Makerspace for prototyping/design and production studios that include: media, cinema, animation, graphics and audio, and high-technology spaces.

Conferencing rooms with telepresence technology provide students the opportunity to communicate with the professional community outside of the university.

Faculty Access

The NCSU faculty have access to all of the amenities found within the library and are probably encouraged to interact with the students by utilization of the same resources. Regular classes are also held out of the library on a daily basis.

Unique Features

The hunt library has found a very unique way in storing, sorting, and distributing its collection of books. The “bookBot” is a climate controlled book delivery system that can store up to two million books and deliver a single book in as little as five minutes from time of order. This drastically saves on space, yet, allows for the library to hold it original function.

StartX

Location

StartX is located within the Stanford University area in Stanford California, it also has a close association with Palo Alto’s “Silicon Valley”. Stanford’s 2013 student population is 15,877. This area of California is widely known for its strong startup community.

Support

StartX is a non-profit organization and does not take any equity form the companies that go through their accelerator programs so they must rely on grants and investor donations. In 2012 StartX was awarded a $800k Grant from the Kauffman Foundation and $400k from AT&T, Founders.org, CISCO, Founder Fund, and Groupon. They were later granted and additional $3.6 million from Stanford University in 2013.

Technology

StartX boasts over $100,000 in value from invested partners, including cloud computing and storage credits, developer platforms, and payroll software in addition to drop-in office space and legal advice (Startx). While this might not seem like a lot of technology, they are still within very close proximity to the Stanford campus and their resources.

Faculty Access

StartX is not directly associated with Stanford so they don't receive any Stanford faculty help However, Stanford faculty can apply to be in the accelerator program and many of the staff are mentors within the StartX program. Stanford's community of top founders mentor network of over 200 mentors, cereal entrepreneurs and industry professionals.

Resources

StartX utilizes resources they receive through partnership and investors. They benefit form legal and accounting credits at law firms, computing credits and the Stanford StartX fund, which provide direct support and fundraising help to accelerator companies (StartXVideos 2015). Currently they have supported over 500 founders and 228 companies, which they have helped to raise over 516 million and 2.6 mill per company average (StartXVideos 2015). Also, the StartX Investment fund combined with Stanford's health care fund has 104 investments in 85 companies with over 30 million, total, invested with an average investment size of 2.9 million (StartXVideos 2015). These funds also allow StartX give the students participating in the accelerator a four-five thousand dollar stipend while going through the intensive accelerator program.

Unique features

The most unique feature about the co-working space is that it is 100% student operated. StartX relies heavily on their built up community of past startups and competitive applications to hone in on the students who are willing to be pushed and go the extra mile. They also run the accelerator three times a year

ASU Chandler Innovation Center or ACIC

Location

The ACIC is located in Chandler AZ, 15 miles southeast of Arizona State University in Tempe AZ. The Arizona State University has a student population 76,771, but due to ACIC's distance from the university they might not fully benefit from the ASU's large student population.

Support

The ACIC is a partnership between the City of Chandler, Arizona State University, and TechShop. The ACIC property is owned by the city, ASU offer classes and degree programs out the space while the TechShop operates the "makerspace". TechShop is a for-profit business and is managed and run by paid employees. However, ASU students get free membership to use the facility and equipment, but they must pay for the instructional class before using certain tools and equipment. ASU faculty and staff get a 20% discount on membership fees and ASU non-affiliated people pay regular TecShop membership fees.

Technology

TechShop offers access to over $1 million dollars of advanced machines and tools, sophisticated 2D and 3D design software, and other professional equipment (TechShop 2010). Classroom and workshop spaces area available with additional brainstorming lounge and retail store that sales project materials like wood, hardware, and other prototyping materials. All fundamental tools for prototyping including; wood shop, metal shop, laser cutters, 3-D printers.

Faculty Access

Faculty teaching out of ACIC get access to TechShop facilities and use of equipment, while all other faculty must pay a reduced membership fee to use the facility.

Unique Features

ACIC has a unique taxi service, RubyRide, which is a tiered subscription service that allows people to have car service for fixed monthly fees. However the ACIC TechShop allows students to us this service for free, but only to bring members to the ACIC, while the return ride will be an additional cost.

Recommendations

Each site discussed above are excellent examples of co-working spaces and although they are drastically different form each other in many ways they still offer some similarities that can be transferred onto the University of Arizona's campus co-working space. Of the three sites each had a defined and single location where the space was held and promoted as a "space for co-working and collaboration. While this was a feature they all shared, the following three features where unique to the individual spaces and seem to be foundational to their separate success. These will be the recommendations for the University of Arizona.

Student led organizational structure

The predominantly student led organizational structure of StartX has proved very successful. The students have an enthusiasm for the projects they work on which is useful in attracting new students to join StartX. The university has the beginnings of this student led organization already in place. InnovateUA is a student led organization that is trying foster a culture of collaboration and entrepreneurship (InnvoateUA, 2015). These students are the foundational key to co-working spaces as they are involved in multiple initiatives that look to include and engage students form all different colleges on campus. Like StartX, InnovateUA has an accelerator that allows students to collaboratively work together as the build the foundations of a lean startup business. These director roles within the organization can only be held by UA attending students which insures the co-working space will always have active student participation as it expands. Also, as students graduate and leave the organization they can still remain as mentors for future students involved in the organization, initiatives and co-working space. The community that is built between students participating the co-working space, mentors, and industry professional will insure a healthy and innovative foundation for the space

Access to the latest technology

The Hunt Library was a very effective in having the latest technological advances available for student use. The University of Arizona should offer all the latest in visualization, gaming, programing, and computing (to name a few) within in a single location and available to all students. This would allow for collaboration among students in different colleges spread out through campus to meet in one central area to work on projects. The Hunt library was very effective in breaking down the interdisciplinary boarders among the different colleges by having a single location for people to go. Having access to the latest technology will better prepare students as the begin their new careers as professionals in the real world

Partnerships with For-Profit Makerspaces

Makerspaces are important co-working spaces. The ACIC TechShop allows students and members from all various disciplines and backgrounds to work on projects collaboratively. The University of Arizona should partner with a for-profit makerspace within the city of Tucson that would allow all UA students free us of resources. Many colleges on campus have workshops with tools, software, and other equipment, but it is limited to only those student who attend that particular college. This blocks out collaboration and innovation by limiting the number/variety of diverse backgrounds that are necessary for a successful co-working space.

Conclusion

Co-working spaces within universities foster collaboration between multiple campus disciples and promotes innovation among students and faculty. By breaking down physical and hierarchical barriers and replacing them with an open environment that encourages collaboration and innovation. Through the research of three universities that have successful co-working spaces, this study identified key elements that make each one successful given the diverse approaches. These element were student led engagement, access to the latest technology, and key partnerships with makerspaces. Acting as only foundational recommendations, this study identified three features the University of Arizona could implore in constructing an on campus co-working space. Building a community around a co-working space seems like the most crucial element in the process. While having the latest technology and a makerspace is also recommended, an engaged and committed community of students, faculty and mentors is paramount to the success of any co-working space, Though, some of this foundational work is currently underway within InnovateUA and partnerships with the UA library, there is still plenty of work to do in order to have a successful and productive co-working space.

Limitations

Due to the expansive nature and relatively new trend of co-working spaces in universities, this paper was limited to only tree study sites while a more comprehensive evaluation of all university co-working spaces would have been ideal. Site visits to each location would have been preferred as well, but time constraints and travel costs limited scope of research to online databases and phone interviews. Also, other scholarly research articles on this subject could not be found, limiting any comparative analysis on relevant theories were limited to professional design firms that build co-working spaces.

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