

ENVIRONMENTAL PREFERENCES OF USERS
IN CO-LOCATED COLLEGES

A Dissertation
presented to
the Faculty of the Graduate School
at the University of Missouri-Columbia

In Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy

by
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December 2015

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ENVIRONMENTAL PREFERENCES OF USERS
IN CO-LOCATED COLLEGES

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To my beautiful daughters, Laura and Lindsay, who have continued to inspire and enrich my educational journey. May they both discover and complete their very own journeys in life.

ACKNOWLEDGEMENTS

Santiago Calatrava has said, “You have to have endurance in this profession. You start a project as a young person and then at the end you are another person” (Schlosser, 2006).

During this educational transition, I not only gained an immense amount of awareness and understanding of how environments impact human behavior, but I also experienced many changes in my own life. The addition of two sons-in-law and three grandchildren brings me much joy. I am incredibly blessed.

Additionally, the saying “...it takes a village...” comes to mind when I think of all the people who supported me in one way or another in the completion of this research. I am deeply indebted to Dr. Ronald Phillips, as my chairperson, for his continued inspiration, explanation, guidance, and friendship. He always knew when to encourage and when to allow me to blaze my own trail. A simple thank you is not sufficient for all his efforts in being my foundation.

Appreciation is also due to my committee members, Dr. Ruth Tofle, Dr. Newton D’Souza, Dr. Deanna Sharpe, and Dr. Joseph Johnston, for their willingness to consider co-location from my viewpoint and for providing me valuable feedback which, in turn, inspired me to expand that same viewpoint.

I am truly grateful to Dr. Norma Patterson and Dr. Jared Chamberlain at Argosy University - Phoenix, as well as Chad Williams, Dr. Meryl Epstein, and Maryse Jospitre at The Art Institute of Phoenix for allowing me to come into their colleges to conduct my research. Thanks, too, goes to the faculty, staff and students of both of those institutions for their participation.

The Art Institute of Dallas graciously provided support for my course work for which I am thankful. My colleagues there continually served as cheerleaders, and I am especially grateful to Dr. Leslie Baughman, Dr. Evilu Pridgeon, Dr. David Lipe and Heather Carter for their support. I appreciate Jim Marstiller and Charla Blake, who made those long road trips to Columbia with me as they pursued their own doctoral journeys.

Deep appreciation also goes to the Interior Design Educators Council (IDEC) for awarding me the Carole Price Shanis Scholarship in March 2006.

Further, I want to recognize and thank Deni Cary Phillips for her superb editing skills and treasured friendship, as well as my long-time friends, Kerry Broderson Morrison, Treena Crochet Llewelyn, Debbie Vandever Higgs and JoAnn Shroyer, PhD for always believing in me.

Finally, heart-felt thanks goes to my daughters, Laura and Lindsay, and my sisters, Sandy Stockton Adcock and Sydney Stockton Silipo, as well as other family members and friends (you know who you are) who had to plan events around my availability during this educational journey.

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ABSTRACT

Co-location, the merging of two organizational entities into one shared space, requires collaboration to be successful. The benefits of co-location, such as reduced real estate leases and costs of resources, can be realized if the combined entities are compatible.

This dissertation investigates the compatibility between two co-located education entities through three related questions: What are the environmental preferences among users in a co-located college environment? What are the organization system type preferences of the co-located organizations? Does a distinguishable pattern between environmental preferences and organization system type emerge? A replicated survey of each college's personnel, divided by administration and staff, faculty, and student populations, determined the environmental preferences, or perceptions, of each school's organization systems.

A key behavior that facilitates a positive co-location experience is having the leadership of both entities collaborate and communicate with each other. Mutual respect and professional courtesy are important to those working and learning within a co-located environment.

Two assessment tools were developed and found to be useful in identifying the underlying nature of co-location compatibility. The Wilcoxon Rank

Sum Test was used to analyze preferences. Among the 23 Environmental Preference survey items only one statistically significant difference emerged between the two colleges – student work display areas, wherein both colleges ranked it as an important preference.

Multi-attribute Utility Technology (MAUT) was used to quantify data from the organization systems analysis, composed of four system-types. The system type preferences for the two colleges were aligned across all four system types with only marginal differences reported.

The two colleges were highly compatible. Other organizations may find the instruments useful in determining co-location compatibility.

INTRODUCTION

The organizational and corporate model known as *co-location* addresses maximizing space and resources, allowing office venues to be partially or wholly occupied by two or more entities. In the business domain, co-location is often referred to as a corporate campus or multiplex, while in the medical and community-service fields it is referred to as shared-use facilities. Co-located entities may or may not share environmental needs or preferences. The physical elements of the environment, such as furniture, equipment, lighting, and technical systems are examples of environmental characteristics over which the entities may have some control upon occupancy.

Other factors, such as room sizes, room shapes, and proximities to other rooms are less likely to possess flexible qualities. All of the aforementioned, plus the aesthetic qualities of the space, can be labeled 'environmental preferences'.

According to Becker (1981), these elements shape an environment so that "individuals and groups are able to comfortably, efficiently, safely, and with enjoyment, carry out the kinds of activities, and have the experiences, which they desire and for which an organization or institution exists." Further, Becker posits that "almost all organizational theory fails to take sufficiently into account the physical setting of work" (1981).

The most salient considerations in a study of environmental preferences should be those that support and/or impact the psychological wellbeing of those who will use the spaces. Some of the issues presumed to be inherent to co-located businesses include, but are not limited to, personal and professional security, shared resources, visual and acoustical control, client access and social access – attributes which may also result in negative effects such as territoriality, lack of identity, and the compromised ability to perform. The perceived loss of control by users may contribute to reduced efficiency, diminished communication, a decline in collaboration and problems with employee retention – outcomes that are opposite to those desired in co-location (Becker et al., 2002).

While co-location is considered the best option for project-based work (Hinds & Kiesler, 2002), to date there is no documented Environment and Behavior research that focuses on co-located private colleges. Moreover, there are only marginal examples of empirical investigations across other disciplinary perspectives, such as in large corporate campuses, the health care industry, or rural libraries, places where characteristics of the physical environment that influence successful co-location are noticeably absent. For example, two such studies were conducted in organizations that co-located research and development (R&D) teams, marketing employees and manufacturing managers. One of these studies was longitudinal with surveys conducted both prior to and after co-location, with results that indicated greater levels of communication after co-location within the R&D teams and with people from other departments.

These results were attributed to close physical proximity (Van den Bulte & Moenaert, 1998). The second study also considered communication and collaboration. The results of this investigation reflected: “higher levels of achieving goals collectively; having mutual understanding; informally working together; sharing ideas, information, and/or resources; and, working together as a team” to create managerial perceptions of greater satisfaction (Kahn & McDonough, 1997).

To date, research has focused on the economic rationale or on merging of cultures, such as the study of a facility built to house both local police and firemen (Stinchcomb & Ordaz, 2007). Another example is the merging or co-locating of multiple services in the Family Justice Center, a facility designed by the City of San Diego for assisting survivors of domestic violence (Conklin, 2010). A more recent (2012) study of co-located schools in response to an earthquake in New Zealand found that co-location was a feasible short-term solution for disaster situations, but respondents did not deem it sustainable for a longer timeframe (Ham et al., 2012). Furthermore, the study indicated that student behavior in both types of the co-located schools had neither changed nor improved. In these three studies, there was no mention of the physical attributes that might ensure that the facility met the health, safety and welfare requirements of those who were to inhabit the environments.

The study conducted for this dissertation, the Phoenix study, replicates a pilot study conducted at The Art Institute of Dallas and Argosy University –

Dallas, Texas. The Phoenix study was conducted at the same two institutions housed in Phoenix, Arizona.

The pilot study on which this dissertation rests, was conducted in Dallas, Texas, when Argosy University was relocated into the same facility at North Park East, 8080 Park Lane, occupied by The Art Institute of Dallas since 1988. At that time the colleges occupied floors one through five, and leased part of eight on an as-needed basis.

There are a number of characteristics that distinguish the two co-located institutions. First, The Art Institute of Dallas is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools and is exempt from oversight by the Texas Higher Education Coordinating Board (THECB). Argosy University is accredited by the Higher Learning Commission and is a member of the North Central Association. Argosy University-Dallas is a satellite campus of Argosy University and is approved by the Texas Higher Education Coordinating Board. The differing accreditation requirements presented a serious obstacle to co-location from the organizational oversight point of view.

Another distinguishing characteristic of the two institutions was course scheduling and curriculum emphasis. Argosy students prefer evening and weekend class sessions, and attend semester-long classes, Argosy offers Bachelors, Masters and Doctoral programs in psychology and behavioral

sciences, education and human development, business and information technology, and health sciences at the time of the study.

The Art Institute of Dallas students attend on a quarterly schedule with day and evening classes as well as classes on Saturdays, offering Bachelors and Associates degrees in the applied arts including Fashion Design, Fashion Retail Management, Interior Design, Kitchen and Bath Design, Animation Art and Design, Graphic Design, Video Production, Digital Film and Video Production, Interactive Media Design, Advertising Design, Culinary Arts, and Restaurant and Catering Management, as well as a Master of Arts degree in Design and Media Management at the time of the study.

Co-location directly impacted the following existing spaces: reception; mail room; Mildred M. Kelley Library; human resources; technology; security; parking garage; and, facilities management. Originally, admissions for both colleges were co-located into a single area, but over time they were separated due to the need for space that functioned adequately. Before the colleges were separated, classrooms were shared through an intricate manual scheduling process maintained by the collaboration of the Registrars' Offices of both colleges.

The shared spaces created an environment that lacked unity and transition. Argosy attempted to solve the problem with a branding effort. Their signage contributed to the level of identity confusion for Art Institute students and

visitors, though the signs did clear some confusion for Argosy students and visitors.

Twenty-five people from The Art Institute of Dallas were electronically invited to participate in the study to identify “issues” associated with the co-location of these two institutions. The group included staff, faculty, administrators and students. Sixteen responded positively about participating, and 12 actually participated. As an incentive, lunch and beverages were provided.

The participants were told the purpose of the investigation -- to gather a list of environmental factors they perceived to be important in the co-located workplace/school. Further, the procedures for participant selection were explained to them.

The Director of Institutional Effectiveness and Research from The Art Institute of Dallas facilitated the group due to her expertise in facilitation. Electronically projected Images from all five floors, including classrooms, workspaces, and signage (See Appendix B), were shown to the group. The facilitator led the focus group through a brainstorming session. A list of factors important in the workplace/school environment was identified. Throughout the meeting, the facilitator reminded the group that the factors they were to consider should be limited to and focused on the physical space.

A prioritization process involved writing these factors, one per page, on newsprint that was taped to the walls. Members of the group had five colored

dots, numbered 1-5, placing the dot with the number one on the factor that they felt was most important to them. Then, in sequence, they prioritized factors two through five in a likewise manner.

Permission was granted by the IRB of both institutions – Argosy University – Dallas and the University of Missouri - to send a mass invitation to all staff, faculty and students of Argosy - Dallas. Approximately 250 recipients received invitations to participate -- six people responded, and five actually participated: one staff member, one department chair, one faculty member, and two graduate students. A similar process to that conducted with The Art Institute was utilized.

As presented in Appendix A, the top five preferred constructs were:

1. Functional Space -- received a total value of 8.75, which was nearly twice as high as the next group of factors in preferred order by the two groups. There were strong responses from both groups.

2. Privacy – received a total value of 4.40 and was only listed by the Argosy group. This group strongly preferred this factor.

3. Adequate Space (tied with Logical Adjacencies) -- received third most preferred designation by the two groups for a total value of 3.04. It was more important with the Art Institute group than with the Argosy group.

3. Logical Adjacencies (tied with Adequate Space) – received third place position, for a total value of 3.04.

5. Aesthetics – received fifth place position with a total value of 2.15.

None of the Argosy group listed it as a preference.

The combined list of preferences from these two colleges served as the basis for the survey items used in this dissertation. They are: privacy; adequate classroom space; adequate storage space within the classroom; offices being in close proximity of classrooms; campus aesthetics; security with multiple checkpoints; flexible space within the classrooms; use of sustainable building materials; good acoustics; each college's classrooms physically separated from the other college's classrooms; ability to mingle with the other college's students and staff; options for room temperature controls in each classroom; student work displays; natural daylighting; outside views; appropriate signage; adjustable classroom lighting; branding; adequate office storage; and, adequate office space.

The role of physical environments in co-location has not been adequately researched. Therefore, this dissertation proposes the following research questions:

- (1) What are the environmental preferences among users in a co-located college environment?**
- (2) What is the relationship between preferred organizational system types and environmental preferences?**

(3) Is there a distinguishable response pattern between the two organizations regarding environmental preferences and organization system type preferences?

LITERATURE REVIEW

The following section captures the essence of the literature that has been reviewed and assessed pertinent to the research, the methods and the findings of this dissertation. The research model established in the co-location pilot project at Dallas was based on theoretical perspectives best described by the Environment and Behavior discipline, using environmental perception and cognition as its primary assessment tools. Survey items that relate equally to the faculty, the students and the staff of the co-located facility currently in the Phoenix study addressed the environmental preferences of those individuals in relationship to their perceptions of the organizational systems within their work environments.

Environment and Behavior

Roger Barker, the father of Environment and Behavior (E&B), best known for behavior mapping efforts in Oskaloosa, Kansas from 1947 to 1974, was the first researcher to develop the concept of the 'behavior setting' to help explain the interaction between the individual and the immediate environment. To understand the concept of behavior settings, Hall (1969) suggests they are the

core “of an ecobehavioral theory that is used to predict behavior from nonbehavioral attributes of the settings.” Stodolsky (1971) notes, “The behavior setting theory is an attempt to order those parts or levels of behavior which connect with the environment.”

Barker’s empirical studies determined the discipline’s terminology and emphasis (Orzek, 1987); his research included descriptions of appropriate “methods and procedures for behavior setting studies,” according to Stodolsky (1971).

Environment and Behavior can be described as variables that exist in the environment that draw positive, neutral or negative behaviors from users, an interactive system in which the environment influences behavior and behavior in turn influences the environment. These influences can be used to determine effective alterations. “It should be clear that we are concerned with identifying properties of the environment that enhance some sense of appropriateness or rightness or fit” (Kaplan & Kaplan, 1982).

People have learned to respond to environments in a positive or negative manner depending on their personal backgrounds and preferences -- “preferred environments will in general be ones in which human abilities are more likely to be effective and needs are more likely to be met” (Kaplan, 1973).

Environmental Perception and Cognition

“Perception is reality” is a well-known adage often used by advertising agencies when marketing brand-identity pitches to clients, by college placement center representatives when working with prospective graduates to enhance their resumes, and even parents when lecturing their teenagers on how dressing inappropriately in public can give others the wrong impression. Ittelson has said, “Our perceptions give each of us the only world we know” (Ittelson & Cantril, 1954).

As a subset of Environment and Behavior, environmental *perception* refers to an individual’s observation of one’s surroundings or environment, while environmental *cognition* refers to how individuals make sense of those perceptions.

Perceived environmental quality is also an important consideration as noted by Preiser (1999), “Critical in the notion of performance criteria is the focus on the quality of the built environment as perceived by its users/occupants. In other words, building performance is seen to be critical beyond aspects of energy conservation, life-cycle costing and the functionality of buildings, but it focuses on the meaning and users’ perceptions of buildings.” Jaitli and Hua (2013) suggest that an employee’s perception of environmental support of their performance has a direct impact on their innate sense of belonging and that the aesthetics and layout of their workspace provide their sense of their own level of productivity.

Moreover, one's capacity to understand how to meaningfully interact with the physical environment is also an essential component of environmental preference formation. "We propose that the concern to make sense out of the environment is one of the most pervasive of human needs" (Kaplan & Kaplan, 1983). Perception, therefore, is the act of seeing an object or environment and then filing away a mental image of that object's, or that environment's sights, sounds tastes and/or textures. The act of perception is conducted by an individual "from his own unique position in space and time with his own combination of experiences and needs" (Ittelson & Cantril, 1954). Coming from different backgrounds, cultures, religions, and parts of the world with different values, each person perceives objects differently in the environment (Fischer, 1997; Fishbein, 1976; Heft, 2010; Moore, 1979; Swinburne, 1971). In laymen's terms, Swinburne (1971) has said, "We all perceive beauty and ugliness from different points of view." Blake concurs with this statement by adding "...an individual's perceptual activity must be fabricated from his current organization of personally meaningful and significant experiences" (Blake et al., 1951).

Supplementing this discussion, Rapoport stated, "...the same city can be experienced as either drab or interesting depending on which cities were experienced before...similarly the same town can be seen as clean, safe and quiet, or dirty, dangerous, and noisy, depending on whether one came to it from a metropolis or a rural area" (Rapoport, 1990). Once an object or an environment has been experienced and has been 'coded' in a person's mind as a perception

or an image, often some degree of further action is required, such as creating meaning out of that specific perception and influencing our behaviors in that environment (Evans & Garling, 1991; Kaplan, 1973).

Constructivist theory considers how people assign meaning, or assess a level of knowing their world through individual constructs. Multiple constructs are then connected to form a larger meaning. When further action or a behavioral modification is required, the perception is taken to the next step, that of cognition. Moore defines cognition as the process “by which visual, linguistic, semantic, and behavioral information is selected, encoded, reduced and elaborated, stored, retrieved, decoded and used without implying that this is necessarily a linear process or that these activities are as discrete as these terms might suggest....” (Moore & Golledge, 1976). Cognition of one’s environment is both a reaction to one’s previous experiences within that environment, but also an organization of that experience combined with past experiences and one’s level of development (Fishbein, 1976). Individuals will have different responses due to their own stored meanings (Rapoport, 1990).

Other theories of environmental perception include Gestalt theory, Ecological Perception Theory, and Brunswik Lens theory. Gestalt theory can be simplified to mean that man can “...see things as ‘going together’ because of their similarity, their closeness in space, etc., and that we have a natural tendency to mentally ‘add’ parts to incomplete forms to make whole structures, etc.” (Tolley, 2005).

Ecological Perception theory indicates that man interprets cues for information, "...such as one object superimposed upon another will suggest that the second object is behind the first one..."

The Brunswik Lens theory notes that man becomes more efficient in comprehending the environment through continuation of processing (Tolley, 2005). Different people may perceive the same stimuli differently due to their individual backgrounds and expectation (Tolley, 2005).

Because environments are designed to facilitate or enhance the lives of the users, it is important that the environments meet the needs of the users. Alexander suggested that design professionals are educated to consider environments with a different frame of reference than lay persons (1964). It is for this reason that designers must strive to understand the perceptions and cognitions of those who will use, or inhabit, the environments, and it will require a dynamic collaboration between the two entities – designers and users – to avoid any cognitive disparities that could result in an unsatisfactory environment (Cunningham et al., 1973; Leff & Deutsch, 1973).

The majority of participants in the Phoenix study have either been working or attending classes in a co-located arrangement long enough to assign meaning to the environment, and their behavior has been altered due to this meaning. Therefore, their responses have a higher level of value than soliciting responses

from first-time users or prospective students or employees who have not been engaged in the facility on a regular basis.

Environmental Preferences

When given a choice, most people choose conditions or attributes, “that increase their comfort and sense of competence” (Kaplan & Kaplan, 1983). Ritterfeld and Cupchik (1996) further posit that varying types of cognitive experiences, down to an emotional level, can influence a person’s reaction and/or acceptance of an environment. According to Rashid (2013), many features of the environment can affect both organization performance and productivity.

The Dallas pilot study identified functional/adequate space, privacy, logical adjacencies (proximities), workplace aesthetics, workplace security and flexible workspaces as the salient characteristics of the co-location between The Art Institute of Dallas and Argosy University - Dallas. The same characteristics are investigated in the research conducted with The Art Institute and Argosy University at Phoenix. They include: functional/adequate spaces, privacy, logical adjacencies (proxemics), workplace aesthetics, security, flexible spaces, adequate storage, use of sustainable building materials, appropriate acoustics, separation of spaces, ability to mingle with students/employees from the other organization, thermal control, student displays, natural light, outside views,

appropriate signage, adjustable classroom lighting, and branding location.

A 2003 survey conducted by the International Facility Management Association (IFMA) of the Top 10 Office Complaints included several of the preferences identified in the Dallas pilot study: first and second on the list were “too cold” and “too hot”, or lack of temperature control, fifth was the lack of sufficient storage space, seventh was no workplace privacy, and tenth was noise level too high (“IFMA Survey Ranks Top 10 Office Complaints,” 2003).

Among the preferences included in the Phoenix study, the literature suggests that Functional/Adequate Spaces can lead to greater collaboration. In Haworth’s white paper titled *Collaboration*, Brand writes that physical space and social interaction are important in a collaborative workplace (2009). He makes three points: 1) “[T]he physical environment can influence the social and task interactions among the people in it,” 2) “[T]he physical environment can interfere with the frequency and quality of social interaction,” and 3) “[S]ocial interaction and the layout of space reciprocally influence each other” (2009).

The Herman Miller Company has long been known for furnishings designed for the home, business, healthcare, educational and government settings. They have also been active in identifying environmental and ergonomic factors that could impact workplace satisfaction, comfort and efficiencies. A recent article published by this company states, “Classroom design influences levels of integration and engagement. Engagement and active learning improve

retention' ("Rethinking the Classroom: Spaces Designed for Active and Engaged Learning and Teaching," 2007), which indicates that classrooms must be designed for collaboration and hands-on application.

In his consideration of university space, Temple notes that the physical environment can impact the "teaching and learning, the research, and the other interconnected activities that go on within institutions" (2009). Yet another study found that "[T]eachers in classrooms with inadequate space are more controlling than teachers with adequate space" (Perry, 1977).

Comfort is an individually defined perception. By providing an individual with some control over the environment, such as chairs that have adjustable arms, height or back support, the level of distraction may be reduced ("Rethinking the Classroom: Spaces Designed for Active and Engaged Learning and Teaching," 2007). Teaching while standing, sitting on the desk top, or seated within a group of students are all physical activities of the instructor and require furnishings that comfortably support teaching styles, range of motion and posture ("Verb Classroom Collection," 2015). Additionally, flexible spaces within a classroom that allow students to sit in groups facing each other causing students to become more comfortable with each other and, therefore, more engaged ("Rethinking the Classroom: Spaces Designed for Active and Engaged Learning and Teaching," 2007) – configurations often referred to as learning studios, arranged to permit flexibly instead of lined up in military ranks.

For example, a study at Estrella Mountain Community College in Avondale, Arizona, investigated the interaction and engagement levels of students-to-students and students-to-faculty in two prototype learning studios. The Herman Miller Company was involved in the research and surveyed those students and faculty who utilized the spaces. Among the positive responses recorded, one was that the flexibility of furnishings promoted the use of numerous teaching and learning styles, as well as varying types of activities. The availability of WIFI permitted the use of laptops, which freed up available workspace and the ability to move about the room. Impassive, unengaged behaviors that can occur within a traditional classroom no longer were evidenced due to the collaboratory arrangement of the classroom ("Rethinking the Classroom: Spaces Designed for Active and Engaged Learning and Teaching," 2007).

Privacy, as an attribute of the environment, can also be explained as a psychological state, where one has "a sense of control over access to oneself or one's group"(Sundstrom et al., 1980). The type of privacy ranked as a preferred attribute in this research's pilot study could be defined as architectural privacy, where there is visual and acoustical isolation purposely designed into the environment (Sundstrom et al., 1980).

Cain has been quoted as stating "introverts make up somewhere between one-third and half of the American population" (Cunningham, 2014) and need to work in private. She teamed up with Steelcase to develop Susan Cain Quiet

Spaces “that offer five diverse ways to empower introverts at work” (“Susan Cain Quiet Spaces,” 2014), which includes four design principles: permission to be alone, control over the environment, sensory balance and psychological safety. Chigot (2003) further adds that separate spaces should also be provided for group interactions.

Proxemics, as a term, was introduced in Hall’s (1968) research. It refers to spaces being in close proximity to each other, similar to the observed preference of logical adjacencies in the pilot study for this research. Geographical proximity is often defined as the absolute geographical distance that separates two entities, or places, while other definitions refer to the travel time between two entities (Knoben & Oerlemans, 2006). Having small geographical distances facilitate higher levels of interaction and collaboration (Knoben & Oerlemans, 2006), and specific configurations of interior spaces impact the interaction between employees, which can increase or decrease communication and collaboration (Jaitli & Hua, 2013). Hall also noted that sociofugal spaces, which have a tendency to keep people apart, and sociopetal spaces, which bring people together, can be defined differently among cultures, thereby forcing designers to investigate the proxemics of the culture for which they are designing (1968).

Workplace Aesthetics are important in order to avoid negative psychological effects on employees, which, in turn, can impact the quality of their

work. However, the perception of the aesthetic is difficult to identify because individuals perceive their environments differently (Duke, 1998).

In the past, education facilities were often designed for efficiency and were poorly funded. Now, there is recognition that these environments should provide pleasing architectural experiences for all the senses, as the impressions they provide can shape one's emotions and learning aptitude (Kjaervang, 2010). People evaluate their workplace for both its calming and stimulating qualities, while also observing attributes such as "prestige, status, character, safety, and friendliness based on the environments" they have experienced (Nassar, 2008). In *Visual Quality by Design*, Nassar remarks, "Several studies confirm that the perceived quality of an interior influences people's feelings in it, and those feelings affect the way people feel about others in the interior" (2008).

A Secure Workplace is one that promotes safety for property and individuals in both the workplace and in an educational facility. The built environment can be conceived or adapted to reduce susceptibility to various crimes, which can inflict fear and impact the quality of life of the inhabitants of the environment (Kelly, 2004). Three methods for promoting safety through the reduction of crime include: access control, which incorporates such elements as alarm systems and mechanical access; surveillance, which includes cameras aimed at specific areas, as well as lighted pathways that increase the visibility of offensive behavior by others within the environment; and, territorial reinforcement, which uses design elements such as signage, sidewalks, and

landscaping as natural barriers to promote ownership of the environment, as well as a regular patrol of the area by security personnel (Blurock, 2004; Ekblom, 1995; Kelly, 2004; "School Security Best Practices: Looking Beyond Sandy Hook," 2013). Additionally, the presence of a trained, armed law enforcement officer can help deter criminal activity ("School Security Best Practices: Looking Beyond Sandy Hook," 2013).

New developments in door accessibility technology through existing network wiring ensures the ease of installation of keypads or card readers at a much lower cost ("Schools & Medical Facilities Protect Against Unauthorized Access," 2012). Additionally, the building should not include architectural elements that create spaces in which to hide (Blurock, 2004).

Flexible and/or Adaptable Spaces indicate a building's ability to adapt, convert, or expand (Pati et al., 2008). In order for co-located businesses or colleges to function in harmony, flexible workspaces must be incorporated. Kelley, senior workplace design manager at eBay suggests, "The way people work and the results they produce are intimately bound up with their environment" (2011). She further states, "[S]olutions that give employees more choices have a positive psychological value. Give them greater options for shaping their workplace to their needs, and they will make the space their own" (2011).

In a study of the physical learning environment that supports collaborative learning at the community college level, Wolff notes that the space must be flexibly designed to adapt rapidly to changes (2003). “Flexibility can mean many things, but the simplest method is to create places where different activities can occur within the boundaries of the same space“ (Wolff, 2003). She further recommends providing for multiple purposes with groups of different sizes, which further indicates a need for furnishings that are readily moveable or stackable (Wolff, 2003). Adopting this philosophy, the University of Houston’s Science and Engineering Research and Classroom Complex contains 40 open-concept research labs that were designed to be flexible for use by the College of Natural Sciences and Mathematics, as well as the Cullen College of Engineering (Orsborn, 2008).

Additionally, the 2001 study, *Workplace Values: How Employees Want to Work*, conducted by the American Society of Interior Designers also supported design flexibility (ASID, 2001). One of the respondents stated, “Places that can be used in many different ways will be necessary” (ASID, 2001). Hassell, AIA, agrees and states that the spaces should be significant in size in order to facilitate “collaboration and interactive work among students and teachers” (2011) through the use of tables and chairs that are flexible and meet the ergonomic needs of the users.

Within one study, it was noted that “students appreciate having the physical flexibility to work comfortably in teams as well as having space between

groups to limit distractions” (Espey, 2008), and that flexible space allows an instructor to circulate between the collaborative teams to provide feedback more effectively. Miller-Cochran & Gierdowski (2013) found that a flexible BYOT (bring your own technology) classroom design provided “the flexibility for classroom activities and pedagogical approaches that teachers longed for...” Space that adapts to learning supports both the students and the faculty, while reinforcing the institution’s “commitment to education excellence” (Neill & Etheridge, 2008).

Adequate Storage, whether in the classroom or the office, is a topic where little empirical research exists. Supporting this statement, Brand (personal communication, June 21, 2015) writes, “One challenge with finding useful published research is that in the vast majority of real-world projects there is not much opportunity to study storage, because architects and designers assume that they understand based on their workshops and design research, that they understand and provide the amount and type(s) of storage people need to be productive. Thus very few aspects of this variable are manipulable in order to compare outcomes of various storage strategies.” He continues to write, “Thus, storage itself rarely predicts storage satisfaction (or other perceptions about storage); rather, psychosocial factors such as job satisfaction, organizational loyalty, organizational citizenship behavior, organizational justice (and many other similar issues) play an influential role in predicting satisfaction with physical environmental elements.”

However, in a 2003 survey, the International Facility Managers Association (IFMA), with approximately 17,300 members at that time, cited insufficient storage/filing space in workstations ranked number five among workplaces of 100 employees or more ("IFMA Survey Ranks Top 10 Office Complaints," 2003). Supported by a Haworth white paper Brand (2009) posits organizational systems should consider the actual storage needs, styles and preferences of employees.

Therefore, many of the major systems furniture manufacturers have addressed this topic over the years with various products. SMED International, based in Calgary, Alberta, Canada, in the design of the Critical Mass offices, ensured that all components of the workstations were multipurpose, such as movable storage and filing furniture pieces that could also double as seating (Vangen, 2001).

In a study conducted by Steelcase, a furniture manufacturer, it was noted that "lockable and hard to access storage in shared classrooms is not used by instructors" ("Verb Classroom Collection," 2015), therefore, movable, easily accessible storage is a better solution, such as their product called Verb, "an integrated, mobile classroom collection designed to support a range of teaching and learning styles on demand" ("Verb Classroom Collection," 2015). According to Martin (2012), the circumstance of the shrinking workspace for individuals leads to a system that is more centralized.

In terms of the Use of Sustainable Building Materials, Finlay and Massey posit, “There is no single campus that has fully embraced every facet of sustainability, but numerous higher education institutions are strong leaders in diverse areas” (2012). In their case study to determine motivations and barriers to the construction of sustainable buildings on the campus of the University of Waterloo, Richardson and Lynes (2007) found four areas of weaknesses: a lack of leadership with decision-making authority; a lack of quantifiable targets; a lack of communication between the stakeholders; and, a structure that places more emphasis on initial costs than on long-range energy costs – all reasons why other institutions have not progressed with the sustainability issue.

When considering Appropriate Acoustics, one must not only consider the noise levels of active collaborative classrooms, but also examine speech privacy in open-office environments, such as those with cubicles. Described by Hedge (1992) as being acute in this type of environment, he suggests the possibility of expanding the amount and level of sound absorbency in the room’s surfaces while also adding white noise to the environment. Grouping teams or those who need to frequently communicate close together is another method for controlling noise (Chigot, 2003).

In classroom design, current standards indicate a maximum of reverberation times (RT) of 0.6 seconds for the processing of speech and teaching efforts, but that level is often exceeded due to poor construction or renovation techniques (Persson et al., 2013). Faculty who teach in the

classrooms with high RT levels often believe their jobs to be less comfortable, filled with conflict, and resulting in lower aspirations for staying on the job (Persson et al., 2013). Additionally, many studies have shown that in noisy classrooms, students' blood pressure increases significantly, while mental concentration decreases (Lackney, 1997).

By identifying Separation of Spaces as a preference, this construct could be considered a paradigm shift and detrimental to co-location. Becker and Parsons posit, (2007) "While poor physical design may constitute a barrier to teamwork and communication, good design of the physical environment can be viewed as an affordance or 'opportunity' to overcome social and organizational barriers more often discussed in the literature."

Whereas the two colleges might consider themselves in different worlds, in actuality they are merely subcultures within the same system with each having its own elements of specialization (Siskin, 1991). Both of the colleges in the Phoenix study need specific spaces that are not required to be shared with each other, such as sewing labs, photography studios and counseling observation rooms, so the need to be territorial over these spaces is justified.

Jesson and Wilson (2003) defined the term *territory* as an area that is claimed and defended by a single group, while Dyson-Hudson and Smith (1978) notes, "The benefits of territoriality are simply those that result from exclusive access to critical resources..." Within the environment and behavior focus of

research, it has been observed that there can be an “emotional significance of the physical environment to members or the work organization’ (Mazumdar, 1992) and individuals can express deprivation feelings when access to a specific place or setting is not possible (Mazumdar, 1992).

The *Ability to Mingle with Students/Employees from the Other Organization* can be directly related to symbiosis and synergy. Symbiosis is an association where two cultures, or species, reside or work in close proximity and interact often ("Symbiosis," 2009). The term originated with German botanist de Bary in 1879 who stated that often the interdependency of this association is so great that the two cultures must rely on each other for existence, and in the field of biology, this is referred to as the theory of mutualism ("Symbiosis," 2009). Similarly, synergy refers to the combination of efforts of employees to achieve greater results than could have been realized individually (Xaxx, 2011). Stated another way, “[t]he power to combine the perspectives, resources, and skills of a group of people and organizations has been called synergy” (Lasker et al., 2001). When synergy occurs in the workplace, cooperation, inspiration, communication and efficiency are all increased (Xaxx, 2011).

Regarding the ability to control the temperature in the classrooms, or *Thermal Control*, “Hot and cold conditions can impair the performance of a variety of activities ...”, according to Hedge (1992), and even minor variations have an impact upon work and test performance. Lane (1966)(1966) agrees and cites the Iowa Center for Research in School Administration report, finding that

students learn better in model thermal conditions. Additionally, a student's problem-solving abilities are impacted by temperature changes within the classroom (Harmon, 1953). Studies examining thermal comfort, going back over half a century, have indicated influences in attention spans, dexterity, and increased physiological stress (Lackney, 1997).

Student Displays should be "created not for entertainment but to educate others on what really happens in classrooms," according to Yu (2008), which supports her teaching philosophy that is based on the Reggio Emilia approach that advocates that the creative process be fully documented and displayed instead of just the end result.

When contemplating Natural Light, Alker (2014) notes "...workers with offices that have windows receive 173% more white light (daylight) exposure during work hours and sleep an average of 46 minutes more per night," which improves productivity. According to Franklin (2006), "...the shifting patterns of light that signal changes in the time of day and season..." can provide mood and productivity lifts. Additionally, much data has been gathered to prove that daylight is requisite to regulate people's circadian rhythms (Alexander et al., 1977), while Lackney (1997) posits that students were less tired after studying in natural light than in the traditionally lit classroom.

"Research shows that regular contact with nature boosts physical and mental health as well as productivity..." (Franklin, 2006) thereby making Outside

Views an important preference in an environment. This preference, termed biophilia, was first explained by Harvard biologist Wilson in 1984, and is “a genetically encoded human propensity” (Clowney, 2013). According to Franklin (2006), studies of surgical patients with views of trees healed quicker and required less pain medication than those without views, while office and factory workers were both happier and more productive after their company relocated to a building with skylights and windows. Further, and specifically in school environments, Tanner states, “Rather than being a distraction that disrupts the learning process, an argument often used from the convention wisdom or best practices side, windows provide a necessary relief for students” (2008).

Appropriate Signage and Branding/Logo go hand-in-hand and also refer to wayfinding, especially on college campuses. While signage has often been an afterthought due to designer’s perception that it can be a distraction from the aesthetics of the building (Dolan, 2011), Kennedy suggests “...inadequate signage can create anxiety that distracts” (2004) from the reason for being in the location. Further, he states that the system used to display information “on a campus reflects the image of the institution” (Kennedy, 2004). The University of Vermont’s master plan states that signage must provide a sense of place, create a welcoming environment and build on the “landscape and architectural legacy of the campus’s existing physical plant” (Kennedy, 2004). Additionally, Helvacioğlu & Olguntürk indicated that color has an impact on signage but that color differences do not impact the remembrance of the route (2011); however,

because a school's identity is often linked to its school colors, those colors are predominant in the campus signage (Kennedy, 2006). Dolan (2011) agrees and suggests that the signage colors should be complementary within the school environment.

Dolan (2011) notes that while integrating signage into the design process, it should also include "brand reinforcement, wayfinding and regulatory, as well as specialty, signs" (Dolan, 2011), such as ADA signage, directories, and maps, Further, the designer must bear in mind that ADA and local regulations require specifics such as tactile and visual signage which can vary in size and height depending on the locale (Dolan, 2011).

Adjustable Classroom Lighting is important to facilitate differing types of learning activities within a classroom, such as lecture, collaborative learning, computing, etc. Faculty must have the option to provide a variety of well- and dimly-lit classrooms for reading and other activities (Lackney, 1997).

Co-location

Rashid states, "Several departments or functional units of an organization are said to be co-located when they share the same space" (2013). Initial development of co-located businesses surfaced in the telecom hotels where facilities were built to house datacenters of multiple internet providers. However, examples of co-located organizations and businesses can be as common as

one's regular encounter with a Starbucks or Taco Bell inside the local Target store or in airport terminals where multiple airlines share interior space, security monitoring systems, and arrival and departure gates (de Neufville & Belin, 2002).

While examples of co-located organizations vary widely, perhaps the most challenging pairings involve shared office spaces and resources where users' needs vary, and where certain spaces are communally shared, such as copy/print rooms, and conference rooms. In addition, issues of privacy and acoustical and visual control are raised when open workspaces or cubicles comprise part of the work area.

In concept, co-located organizations, corporate campuses, shared-use facilities and multiplexes have many similarities, and the terms are often used interchangeably. Most were initially developed to promote economic efficiency (de Neufville & Belin, 2002; Leibson Hawkins, 2002). The International Workplace Studies Program lists the primary values for merging into a co-located facility as efficiency and control, identity, and ease of face-to-face communication from department to department. The top rated amenities preferred by employees included dining facilities, fitness centers, ATM banking facilities, medical services, and learning centers ("The Value of a Campus: Costs and Benefits of Collocation," 2002). Additionally, Becker adds flexibility, branding, security, attraction/retention of staff and provision of amenities to this list (Becker et al., 2002).

Educational institutions frequently utilize co-location. The Peoria Public Schools in Peoria, Illinois, designed and built two Community Learning Centers with flexible space to provide education from birth through the eighth grade, adult education classrooms, child care services, cafes, and both formal and informal community gathering spaces (Helm et al., 2010). At the university level, examples of co-location include DePaul University's DePaul Center, which includes six floors for the university, four floors leased to office tenants and two floors leased for retail space. Another at University Center of Chicago, an 18-story building, provides retail space as well as housing for students from DePaul, Columbia College of Chicago and Roosevelt University (McHugh & Meister, 2004). Romeo (2004) cites more examples of schools co-located with community centers, public libraries, and city parks, such as The Henry Ford Academy that is located on the campus of the Henry Ford Museum in Dearborn, Michigan .

Other co-located school examples include: Elmhurst College Circle Hall, which contains various academic departments, a community speech clinic and space to accommodate large events; the Campus Center at the University of Massachusetts at Boston, which contains offices, a bookstore, lounges, a game room, conference rooms and a ballroom; the West Village Buildings G and H, housing classrooms as well as four- and- five-person apartments; and Weatherford Hall at Oregon State University, which contains student rooms, rooms for live-in faculty, a café, a library and meeting rooms ("New Campus Architecture: a Sampling," 2005).

Also, the performing arts center at the East Grand Rapids High School in East Grand Rapids, Michigan can transform from a concert hall to a space that accommodates lectures, panel discussions and dramatic performances, all requiring different architecture (Gore, 2001). Similar design challenges were evident in the shared-use facility at Penn State University that combines WPSU TV/FM, the Penn State Public Broadcasting Studio, with the campus' web-based education group (Tisch, 2007). The reconstruction of L. B. Landry High School in New Orleans, Louisiana, after its demolition in Hurricane Katrina, gave the area both an educational facility and a community resource with a second gym for public use, a health clinic and a media center (Nayer, 2011). The Valley-North Laguna Library in Sacramento is part of a public park, and plans to share services with a community center in the near future (Milshtein, 2011).

In the health and community service arenas, public libraries are prime examples of co-location. In rural Australia, public libraries have been co-located with other services such as tourist facilities, government offices and IT/business services and have often shared both the site and the staff (Monley, 2006). The Victorian Council of Social Service in Melbourne, Australia, has multiple shared facilities sites, including child care centers merged with maternal and pediatric health centers and kindergartens that sublet the facilities after hours to playgroups ("Victorian Competition and Efficiency Commission Inquiry into the Sharing of Government and Community Facilities," 2009). Several rural health departments have combined with community health centers in North Carolina

and share “reception and waiting areas, laboratories, conference and education rooms, and employees’ rooms” (Lambrew et al., 1993). Also in North Carolina, examples exist of mental health professionals co-located within a primary care facility (Williams et al., 2006). In the United Kingdom, community pharmaceutical services are co-located with health centers (Jesson & Wilson, 2003), making overall healthcare a much more efficient process for the patient.

Those familiar with Education City, a project of Qatar Foundation, which was founded by His Highness Sheikh Hamad Bin Khalifa Al Thani, Emir of Qatar, and chaired by Her Highness Sheikha Mozah Bint Nasser Al Missned, understand that the campus site is filled with a number of research centers, as well as branch campuses of several universities: Virginia Commonwealth University, Weill Cornell Medical College, Texas A&M University, Carnegie Mellon University, Georgetown University School of Foreign Service, Northwestern University, HEC Paris (*école des Hautes Etudes Commerciales de Paris*) and University College London (“Qatar Science & Technology Park to be inaugurated on 16 March 2009 before / 5.,” 2009). In 2009, the Qatar Science and Technology Park was opened and co-located on the campus to “interact with the universities and develop new technologies” (“Qatar Science & Technology Park to be inaugurated on 16 March 2009 before / 5.,” 2009).

Organizational Systems

It is important to understand how organizational systems can contribute to a clearer understanding of the challenges associated with co-located entities.

Originally proposed by Ludwig von Bertalanffy, an organizational system is defined as a deliberately organized group of people with common goals, such as “...a function of input, processes with the system and output” (Smith, 2013).

Several behavioral science disciplines contribute to the study of organizational systems – their goal is to explain particular behaviors, predict future outcomes, and facilitate control over behaviors (Robbins, 2005). For example, Theory X, developed by McGregor, presupposes that employees require micro-management from management and are only motivated by incentives, while Theory Y presupposes “...that employees derive satisfaction in the jobs that they are doing....” (“Organizational Behavior Theory,” 2013).

An organizational system “...works on the principle that every organization is like a system defined by boundaries...” (“Organizational Behavior Theory,” 2013). Many researchers have used the analogy that organizational systems are similar to “...‘little societies,’ as social systems equipped with socialization processes, social norms and structures” (Allaire & Firsirotu, 1984), which indicates that they inherently possess specific cultural properties, such as “...meanings, values and beliefs, that they nurture legends, myths and stories, and are festooned with rites, trials and ceremonies” (Allaire & Firsirotu, 1984).

An organization's systems can influence the design of the workspace environment. According to Daft (2004), "An organization's culture is unwritten but can be observed in its stories, slogans, ceremonies, dress, and office layout." Robbins supports this philosophy by noting that cognitive dissonance among employees from negative job perceptions can affect job satisfaction. Factors that typically cause dissonance are stimulating work tasks, equitable rewards, a supportive work environment, and supportive colleagues (Robbins, 2005). Jaitli and Hua (2013) supplement this statement by adding that meeting organizational objectives is dependent upon the behavior of the employees, which indicates the importance of the physical components and aesthetics of their workspace.

Further, Daft (2004) refers to unity of direction theory by stating, "similar activities in an organization should be grouped together under one manager." In co-located organizations, support services such as information technology, custodial, security, etc., are often grouped together.

"Organizations and their members resist change" (Robbins, 2005). This resistance obstructs flexibility and progress in an "age of discontinuity" (Robbins, 2005). Individual reasons for this resistance may include habit, a high need for security, fear of decreased income, fear of the unknown, and selective information processing. Organizational reasons for resistance to change include structural inertia, such as formalization, constraining group norms, threats to expertise, power relationships, and resource allocation.

An attempt to overcome these elements of resistance before altering workplace environments can be difficult, at best, but when change is managed responsibly, it can lead to less negativity in the long-term cultural change. Communication about the project that provides general information to employees is of utmost importance, and may include the questions *who, what, why, when* and *where*, as well as the expected goals. However, most employees want to know how changes will impact them, personally -- communicating this information is also of great importance (Becker et al., 1997). Further, using the strategy that greater costs per person for change management activities result in more favorable assessments of change management processes and the new workplace facility (Becker et al., 1997). Some recommendations to managers for increasing acceptance and facilitating speedier adaptations include: recruiting employees to serve on various change-management committees; encouraging employees to share their own thoughts about the design of the facilities; using multiple methods to convey information; providing visual aids that permit employees to envision themselves in the new workplace; and, listening to employee concerns (Becker et al., 1997).

Rogers defines change-management as diffusion of innovation, which is a “process by which an innovation is communicated through certain channels over time among the members of a social system” (Rogers, 2003). Many of his techniques are similar to those cited by Becker, although he supports the use of

“change agents” who are employees within the organization that rally with co-workers to support the change throughout the process.

Communicating with employees and allowing them to participate in the decision making process, while providing support and rewards, will lower resistance and create a learning organization, or one that favors adaptation, with members sharing the organization’s vision. By applying this method, a community can be formed, such as described by Peck (1987), through a four-step process: 1) denial, where group members disregard differences and pretend the community is already established; 2) recognition of differences and attempt to maintain the status quo by eliminating them; 3) recognition of failure to control differences; and, 4) beginning to communicate and collaborate, while embracing differences (Walonick, 1993). This process is highly important in the formation of co-located organizations.

Employee communication and participation was applied in a study of co-located libraries at the University of Washington, Bothell and Cascadia Community College. Joint meetings of librarians were conducted throughout the co-location timeline to form bonds and to develop a mission of serving all students equally. One tactic was to assign librarians with similar areas of expertise to service that area across institutions (Fugate, 2001). The results have been positive from the perspective of both institutions, and a true sense of community has been formed.

The second part of the survey, the Organizational Systems Assessment Survey (OSAS), is based on previous research from the early 1990's in family theory/family development (Phillips, 2012). Originally the ORAS – Organizational Regime Systems Assessment Survey, the name was recently modified to avoid negative perceptions of the term *regime*, even though it is used throughout the literature. The OSAS evolved from research by Kantor and Lehr (1975) who recognized the family as an organizational component of analysis by developing a theoretical framework using the family structure as a basis. The Family Regime Assessment Scale (FRAS), was developed from research by Imig and Phillips (1992), and it quantified and categorized family unit preferences using a systems viewpoint. Later, Phillips (2012) converted the theoretical principles from the FRAS into an environment-behavior model, which then enabled him to apply it to the workplace. According to Phillips (2012), the survey instrument, “assesses an organization’s ‘world view’ or ‘regime’ across eight critical dimensions within two conceptual domains, identifies the dominant organizational regime, how its components interact, draws comparisons between ‘actual’ and ‘ideal’ conditions, and links the regime to environmental characteristics required to achieve an organization’s desired goals. It meets the challenge of interconnectivity by embracing its intrinsic complexity rather than diluting it.”

There are four system preferences, or types, established by Phillips (2012), that classify an individual’s organizational worldview within the workplace.

Those four system preferences, and their characteristics, are presented in stereotypical extremes in a mutually independent configuration as follows:

- **CLOSED** (the THESIS): Continuity-oriented, Stability, The Organization Comes First, Loyalty, Minimize Change, Hierarchical Structure, Diverse Viewpoints Not Permitted, Traditional. *'We do things this way because that's the way we've always done them.'*
- **RANDOM** (the ANTI-THESIS): Discontinuity-oriented, Individuality-focused, Self-interest Comes First, Absolute Minimum Organization, Promotes Change, Hierarchical Structure is Avoided, All Viewpoints Encouraged, Creativity. *'Do your own thing.'*
- **OPEN** (the SYNTHESIS): Consensus-oriented, Adaptability, Individual and Organizational Interests are Equal, Dialogue, Discussion and Negotiation are Sought, Interdependence, Seek Information Useful for Problem Solving, Cohesive. *'We can talk it out.'*
- **SYNCHRONOUS** (the ANTI-SYNTHESIS): Peace, Harmony and Tranquility, Cooperation without Conflict, Commitment to Perfection, Individual Interests and Organizational Interests Coincide, Under-structured, Smoothly and Closely Coordinated, Interdependence, Organizational Identity and Membership is Paramount, Timelessness. *'What is, is; what is not, is not.'*

The survey contains two perceptual conditions of the organizational preferences characteristics noted above. First, the *Actual Condition*, or how an individual perceives how his workplace is performing, or its operational mode. Second, the *Ideal Condition*, or how an individual prefers his workplace to perform. Three beneficial analyses can be obtained from these two preferences: an assessment of the individuals' perceptions of the activities occurring at work on a daily basis, an appraisal of both similarities and dissimilarities of the individuals' perceptions of the day-to-day occurrences as they are preferred, and an examination of the congruence between individuals' Actual and Ideal perceptions of organizational activity, which is the most important for this research (Phillips, 2012).

Co-location congruence can best be examined using an organizational worldview theoretical framework. A fifth item measures the importance assigned by the individuals to each of the four domains: CONTROL, CONTENT, MEANING, and AFFECT. The OSAS structure "has the capacity to assist in comprehending diverse human activity as a system of regularity and predictability" (Phillips, 2012).

Co-housing

Similar in concept to workplace co-location, but from a residential perspective, co-housing is presented here as a parallel illustration of organization

system integration. People who live in co-housing arrangements are, to some extent, asked to blend their environmental and organizational system type preferences into a harmonious amalgam. Understanding the nature of this dynamic in a co-housing context is also germane to the dissertation research.

Co-housing can be defined as living within an intentional group, or community, and was created in Denmark and the Netherlands in the 1960s, (Bamford, 2005) as observed in “the secular history of utopian communities and communitarian movements (Chiodelli & Baglione, 2013). Korpela (2012) posits that co-housing “refers to groups with the sole interest of joining assets and efforts to produce housing that meets the parallel needs of the individual persons or families.” Another term for co-housing is collective housing and is defined as “housing that features spaces and facilities for joint use by all residents who also maintain their individual households” (Franck, 1989). In Denmark, this type of housing is called “bofaelleskaber,” while those in the Netherlands call it “central woheen” (Ahrentzen, 1996).

Co-housing differs from the communes of the 1960s in that people want to live in a neighborhood or complex with some shared resources and/or facilities while continuing to maintain their privacy within their own individual residence(Bamford, 2005), which provides both social interaction and solitude (Ahrentzen, 2002). This type of housing community is primarily self-organized and includes shared spaces (Tummers, 2011). Co-housing often integrates

varying demographics, including household composition and age groups (McCamant & Durrett, 1989).

The theoretical framework used by Torres-Antonini (2001) in exploring co-housing is based on behavior setting theory (Barker, 1968) and pattern language theory (Alexander et al., 1977). According to Torres-Antonini (2001), behavior setting theory describes the manner in which the environment offers “both environmental and psychosocial cues: a setting with specific characteristics – not only layout and furnishings but also participating population – and a program that defines and regulates possible behavior,” while Alexander’s pattern language theory (1977) suggests the patterns of activities within a space are directly related to specific geometric patterns of that space. Torres-Antonini (2001) provides a detailed section of qualitative observations of how Lake Claire Cohousing illustrates both behavior setting theory and pattern language theory, including a summary of the design features that foster social contact.

The most common variation of co-housing is the self-work model where the inhabitants work together to provide meals and other tasks that benefit their community (Vestbro, 2010). Glass (2012) posits “co-housing communities are physically designed to encourage the development of a sense of neighborhood and community.”

This specific type of housing has been viewed as a resourceful solution to the environmental problems of today and to restore social relationships between

people, although it “is a quantitatively limited phenomenon” (Chiodelli & Baglione, 2013). The vast majority of the literature regarding co-housing is either qualitative and focused upon social interaction, or descriptive and focused upon the process of developing the housing unit. Torres-Antonini (2001) substantiates in her study that co-housing design – specifically the layout of space and circulation, as well as densities - has an impact on social behaviors.

Tyvimaa (2011) says that “the physical environment plays a significant role when describing the social environment in co-housing.” She notes the dining room of Loppukiri is a common gathering site, since the inhabitants cook together daily, and so is the fireplace room on the top floor next to the sauna, which is also in daily use (Tyvimaa, 2011). In her interviews, she learned that the common areas made it simple to meet others within the community, which promotes social interaction. She also noted that residents voiced a need for their own space when privacy is desired (Tyvimaa, 2011). Supporting this view, Torres-Antonini (2001) conducted empirical research within a co-housing community in the United States and confirmed that the co-housing’s design features of proxemics, circulation and other space planning strategies, as well as shared facilities have an impact on social interaction.

Another quantitative study on co-housing was conducted in Sweden at 14 communities by Jung Shin Choi (2004) where the satisfaction of the residents in regard to the physical environment and the design of the building, common facilities and individual units were rated using a five-point Likert-type scale. The

results revealed fairly high mean scores for the majority of the areas within the communities, such as location of the building, the common laundry, the individual living room and the individual bathroom. Scoring lower than the mean 3.00 were the common bath/sauna, the common exercise room, the common hobby room, and individual storage space. Overall, the residents stated “relatively high satisfaction with the building design (Choi, 2004).

Co-housing also differs from the form of shared housing in which unrelated individuals share a single unit to form a single household where private areas of the home, such as the kitchens and bathrooms, are shared by all the residents of the unit (Franck, 1989). Some examples of shared housing include college dorms, military barracks, convents and group homes for those with disabilities (Franck, 1989). Sherry Ahrentzen (1996, 2002) has conducted much research on shared dwelling alternatives that can adapt to changing households.

Tummers (2011) cites the reasons people become involved in self-organized co-housing communities are “to create protected environments for independent living of people with disabilities, to develop inner city locations for mixed income groups, to create non-toxic sustainable housing or to share domestic facilities and recreation. According to Cohousing.org (“Cohousing - Building a better society one neighborhood at a time,” 2013), this type of housing is collaborative with occupants participating in the design, management and maintenance of their community which encourages both socializing and privacy.

Its focus on interaction and collaboration differs from a gated residential development, which fulfills the need for protection (Tummers, 2011).

An example of co-housing, the Poortgebouw building in Rotterdam, which was originally constructed in 1879 as a harbor office, was refurbished around 1980 into 30 individual units with a shared kitchen, showers, laundry facilities and bicycle storage to “promote the social and creative interaction between residents” (Tummers, 2011). Another example is De Waterspin in the inner city of The Hague. This community is a combination of both a refurbished building and new construction. Based on sustainable principles, this property contains 21 rental apartments that are owned by the association, 18 units that are occupied by the owners, a meeting room, a community garden, a playground, and several spaces for cultural events (Tummers, 2011).

A third example of co-housing that was under construction at the time the article was written is Casa Malta in Helsinki, Finland, which is an apartment complex of 61 units with balconies, underground parking, 2 commercial spaces, a small common backyard, a multi-purpose hall with a restaurant-size kitchen and corner for children’s play (Korpela, 2012). Other common areas include the top floor of the building where saunas are located, a small den with fireplace for informal gatherings, and a roof garden. Another aspect of Casa Malta is that it will be constructed with “high ecological and energy-saving standards, with quadruple windows and thick insulation” (Korpela, 2012). Yet another example is Loppukiri, also in Helsinki, Finland, and contains 58 apartments and common

areas such as “a library, a dining room, a fitness room, a roof-top terrace and a sauna” (Tyvimaa, 2011). McCamant and Durrett (1989) identified 38 co-housing communities in Denmark, built from 1972-1986, which all have shared laundry facilities, living rooms, children’s spaces, and dining facilities.

In Waitakere, West Auckland, New Zealand, Earthsong Eco-Neighbourhood is based on “social and environmental sustainability” (Dod, 2013). The site of this community was designed to facilitate the residents instead of automobile traffic by including 32 medium-density houses, grouped together “in nodes to create a sense of togetherness within the larger community,” according to Dod (2013), with open areas for walking paths. The Common House and other shared spaces contain laundries, meeting rooms, play areas for the children and a community garden. Interestingly, a common characteristic within the community is that it is multigenerational. Dod (2013) discovered through resident interviews that they liked the community’s layout, allowing interaction with others; complaints centered primarily around the lack of storage space within the individual residences.

Yet another form of co-housing appeared in the United States in three communities in California, Virginia and Colorado between 2005-2007 with a fourth opening in New Mexico in 2010 (Glass, 2012), where elder or senior residents create and manage their own community. As an example, Glacier Circle, in Davis, California, contains eight residential units and a Common House that the residents maintain. It contains an apartment for guests, a dining area and

kitchen for shared meals and an office/storage space for an administrative assistant and a garden. Each residence includes two bedrooms (in case a live-in aide is required); a private yard and patio with few, if any, steps; the master bedroom downstairs; adequate storage space; universally-designed doorways and bathrooms; an abundance of natural light; and an orientation to the south (Glass, 2012). Currently, an initiative in northern Europe proposes to develop co-housing for elder care to provide an ambiance that allows older inhabitants to continue being involved in activities with others to prevent loneliness, while still maintaining some level of privacy when desired.

Other examples include ElderSpirit Community in Abingdon, Virginia, and Silver Sage in Boulder, Colorado. All of the twenty-nine units of ElderSpirit have a side facing the common green space (Glass, 2012). It, too, includes a Common House, as well as a Spirit House for informal meetings, weekly meetings of a community-wide Quaker group, and a weekly Buddhist meditation (Glass, 2012). Silver Sage contains 16 units: a two-story building with six units and the Common House on the first floor, six units on the second floor and two duplex buildings are across from each end of the main building with a courtyard in the center for a community garden. All units open to the outside, and there is also a woodshop, garage space and a bike shed. The Common House includes a large kitchen and dining space for shared potluck dinners, a living room, and sewing/crafts room and a meditation room (Glass, 2012).

Often the shared resources and facilities include common spaces, such as parks, gardens and courtyards and facilities such as a “kitchen, dining space, common laundry” (Bamford, 2005) and other rooms. Det Kreative Seniorbo (DKS) in Odense, Denmark, was designed for senior residents, with “the common room, which includes a kitchen, dining area and laundry, with an adjoining guest room” (Bamford, 2005) for visitors to stay overnight on occasion. This common room also serves as a place for social activities and for workshops for arts and crafts.

Co-housing is not developing rapidly, however. Chicodelli and Baglione (2013) quote the Cohousing Association of the United States in reporting 120 co-housing communities completed within the United States and 24 co-housing communities in Canada. They further note that even in European “countries where co-housing is much more frequent, co-housers constitute a tiny fraction of the total residents” as only 1 percent of the residents of Denmark and 0.05 percent of the residents of Sweden live in co-housing (Chiodelli & Baglione, 2013). In Germany there are 500 communities, while there are only four in Italy.

According to the literature, the two main problems with co-housing are similar to other types of private or gated residential development - that of “social, ethnic and ideological homogeneity” (Chiodelli & Baglione, 2013) of inhabitants and a lack of assimilation with the surrounding neighborhoods (Chiodelli & Baglione, 2013).

Classroom Design Considerations

Painter, et al (2013), in a literature review, posits that the bond between psychology, architecture and design in the classroom environment impacts both instruction and learning. “The design of learning spaces should involve a variety of stakeholders with diverse expertise including architecture, construction, and human resources, among other fields” (Rook et al., 2015).

Two goals of the Painter (2013) report were to assemble research-based data regarding how the design of educational environments impacts learning outcomes for the space, and to assess existing research while providing implications for future study. This report included a section pertinent to co-located colleges – formal learning spaces – that includes the traditional classroom, the lecture hall, the classroom filled with technology amenities, the laboratory with fixed equipment, and the Active Learning Classroom (ALC)/Next Generation Learning Space.

Classroom layout dictates the behavior or teaching style of the instructor, as well as the type of learning activity in which the students are involved (Brooks, 2012). “[I]t is important to design a learning space with the learning process in mind” (Rook et al., 2015). When lecture and group work are both occurring within the classroom, flexibility in the space and furnishings is required (Brooks, 2012). Dane (2009) concurs and suggests training teachers for Active Learning Classrooms.

“Flexibility is often cited as a primary goal in classroom design and furniture procurement decisions” (Henshaw et al., 2011). Blakemore, et al (2011) agree that learning environments need flexibility, both pedagogically and physically. This focus on flexibility is reiterated by Sanders (2011) suggesting the classroom furnishings can have an impact on the ease of transitioning between teaching methods.

Theoretical Framework

The following research questions are proposed:

- (1) What are the environmental preferences among users in a co-located college environment?**
- (2) What is the relationship between preferred organizational system types and environmental preferences?**
- (3) Is there a distinguishable response pattern between the two organizations regarding environmental preferences and organization system type preferences?**

The theoretical framework for this co-location research evolves from the perspectives of Environment and Behavior theories, environmental perception, and co-location research with an overlay of organizational systems theories, as

these proved to be very significant in the Dallas pilot study. Environmental preferences found in the Dallas pilot study were privacy, adequate classroom space, adequate storage space within the classroom, offices being in close proximity of classrooms, campus aesthetics, security with multiple checkpoints, flexible space within the classrooms, use of sustainable building materials, good acoustics, each college's classrooms physically separated from the other college's classrooms, ability to mingle with the other college's students and staff, options for room temperature controls in each classroom, student work displays, natural daylighting, outside views, appropriate signage, adjustable classroom lighting, branding, adequate office storage, and adequate office space.

Co-location + Environment and Behavior: Because limited empirical research has been conducted in Environment and Behavior studies of co-located settings, it is necessary to investigate this particular type of environment to determine the physical attributes or variables that contribute to positive, neutral or negative behaviors among those using the environment. As users' personal backgrounds aid in developing their environmental preferences, this is also true in co-located settings. Design decisions useful in merging two or more organizational cultures will be dictated by the environmental preferences from the users of both organizations involved in the co-located setting; thus, facilitating a design process that will promote the comfort, efficiency, safety, work-place needs and satisfaction of those who use the space.

Co-location + Environmental Perception: Environmental perception evolves from a person's background and is considered to be the recording of a mental image of an environment based on one's familiarity and requirements (Ittelson & Cantril, 1954). A positive environmental perception is important for users in co-located settings because multiple organizational cultures are using the environment and may have opposing design requirements.

A co-located environment that allows users to positively perceive their individual and shared spaces will promote a collaborative and satisfying workspace. Going a step further, these perceptions will translate to cognition, indicating they have assigned meaning to the environment, which is an example of Constructivist Theory.

Co-location + Organizational Systems: In many co-located environments, the two or more entities occupying the space each have their own preferred organizational system, including branding, processes, hours of operation, etc., which can dictate how the workspace is designed, including aesthetics, space-planning and proxemics (Daft, 2004). Careful consideration must be taken to integrate the needs of both organizations to avoid negative perceptions of a supportive work environment (Robbins, 2005).

Further, measuring the OSAS four domains - CONTROL, CONTENT,

MEANING, and AFFECT – provides an organizational theoretical framework to best examine co-location congruence (Phillips, 2012).

Environment and Behavior + Environmental Perception: Users of an environment behave according to how they perceive the environment should be used. Sufficient research and programming must be conducted, followed by appropriate design development, to help produce an environment that meets the end users' perceptions so that they can function efficiently and be satisfied within that environment.

Environment and Behavior + Organizational Systems: Barker's research, using behavior mapping to describe individuals' interactions with their environment should be important when considering the organizational systems of a workspace, although Becker posits that "almost all organizational theory fails to take sufficiently into account the physical setting of work" (Becker, 1981).

Environmental Perception + Organizational Systems: The established organizational systems in place at one entity may not be the same as the other entity's within the co-located setting, which can lead to negative perceptions of a number of issues, such as personal and professional security, shared resources,

visual and acoustical control, client access, and, social access. Through processes such as diffusion of innovation, which is a “process by which an innovation is communicated through certain channels over time among the members of a social system” (Rogers, 2003), the organizations can successfully blend both cultures, enabling positive perceptions of their workplace environment.

METHODS

Using theoretical perspectives from Environment and Behavior studies, interior design, environmental psychology, and organization system-type preferences, this investigation provides descriptive analyses of the research instrument, Environmental Preferences of Users in Co-located Colleges (See Appendix C). The electronic survey identified interior environmental preferences among faculty, students and staff occupying a co-located space, as well as perceptions of their respective schools' organization system type within The Art Institute of Phoenix population and the Argosy University – Phoenix population. In addition, selected sub-divisions within each organization were explored.

Survey Instrument Development

The Phoenix studies were based on a pilot study conducted in 2009 with co-located entities, The Art Institute of Dallas and Argosy University – Dallas. For contextual information, some preference measures in the pilot study appeared sufficiently similar to be combined into viable constructs. The first, Functional Space, included the following factors identified by the two groups:

- Consistent Technology; Properly Working Things
- Functional Classrooms

- Facility That Works

Another construct, Adequate Space, was formed from factors that included:

- Adequate, Appropriate Space
- Adequate Storage
- Ergonomic Spaces.

Logical Adjacencies, included the factors of adjacencies/proxemics and classrooms close to offices.

Another construct, Work Space Aesthetics includes the following factors:

- Nice Carpet /Finishes for Environment;
- Latest Furnishings/Modern Infrastructure;
- Lovely Environment;
- Quality of FF&E

Finally, Secure Workplace encompassed the following factors cited by the two groups:

- Safe, Secure Learning Environments
- Safe & Secure Parking

- Security Checkpoints

Appendix A illustrates the procedure used to rank the preferences after those with similar connotations had been combined; the number of those who preferred a factor from the group's total number was calculated for both the Argosy group and the Art Institute group. As there were five participants in the Argosy group, if one person chose a particular factor as his first choice, the resulting N would be 1/5 or 0.2. The same analysis was done with the Art Institute's group of 17. The two resulting N's were then added together for a Combined N.

At this point, the Combined N data were transformed by assigning five points to the participants' first choice, four points to their second choice, three points to their third choice, two points to their fourth choice and one point to their fifth choice. The total number of first choice, second choice, etc., was tabulated for each factor.

Upon determining names for the combined factors to result in constructs for further research, the top five in preferred order are:

1. Functional Space had a total value of 8.75, which was nearly twice as high as the next group of factors in preferred order by the two groups. There were strong responses from both groups.
2. Privacy had a total value of 4.40 and was only listed by the Argosy group. However this group strongly preferred this factor.

3. Adequate Space tied with Logical Adjacencies for the third most preferred by the two groups for a total value of 3.04. It was more important with the Art Institute group than with the Argosy group.

3. Logical Adjacencies tied with Adequate Space for the third place position terms of total value of 3.04.

5. Workplace Aesthetics ranked fifth with a total value of 2.15. None of the Argosy group listed it as a preference.

Following closely behind the top five preferred factors were Secure Workplace with a total value of 1.98 and Flexibility with a total value of 1.02.

Pilot results recommended additional research to facilitate the environments' design, leading to successful co-locations among these corporate colleges.

The purpose of the Phoenix survey instrument was to determine if faculty, student and staff populations of both colleges agreed with interior environmental preferences identified in the pilot study, as well as identifying the agreement of perceptions of their schools' organization systems.

After the survey was drafted, the Institutional Review Boards of both the University of Missouri and Argosy University – Phoenix approved its use. The first page of the survey instrument consisted of an informed consent statement. A check-box allowed participants to indicate their willingness to participate in the

study. People who 'declined' to take the survey were not permitted to see the balance of the survey, and people under the age of 18 were prohibited from taking the survey. Participants 18 years or older were directed to the introduction.

The introduction stated the primary goal of the research – to identify the environmental/physical feature preferences of a co-located school/workplace in light of the respondents' organizational worldviews. Participants were further informed that the results would be used for doctoral research. The survey instrument was then partitioned into three sections – interior environmental preferences, worldview of organization systems and demographic information. A summary of the instructions was followed by a specific box that contained the instructions for answering survey items in Section I, Section II and Section III at the beginning of each section.

Section I: Interior Environmental Preferences -- contained 23 items. The six-point Likert scale used for analysis included, *Very Strongly Disagree, Strongly Disagree, Disagree, Agree, Strongly Agree, and Very Strongly Agree*, to identify items statistically correlated in the following domains:

- privacy
- adequate classroom space
- adequate storage space within the classroom
- offices being in close proximity of classrooms
- campus aesthetics

- security with multiple checkpoints
- flexible space within the classrooms
- use of sustainable building materials
- good acoustics
- each college's classrooms physically separated from the other college's classrooms
- ability to mingle with the other college's students
- options for room temperature controls in each classroom
- student work displays
- natural daylighting
- outside views
- appropriate signage
- adjustable classroom lighting
- branding
- adequate office space
- adequate office storage.

Section II: Organizational System Assessment Scale (OSAS) was used to assess both colleges' participants' 'world view' (i.e. preferred organization system type) across eight dimensions within two conceptual domains. The OSAS also identified the dominant organizational system type, how its components

interact, drawing comparisons between 'actual' and 'ideal' conditions, and linked the system type to environmental characteristics required to achieve a colleges' desired goals. Specifically, this portion of the survey contained five items, each having four sub-items. Participants assigned a value of 10 to only one response for the Actual condition, i.e., participants' current perception, then, assign a value from 0-9 to each of the remaining responses in the Actual value list, as compared with the one that received a value of 10, which best described their opinion. This procedure was repeated for the Ideal condition, the conditions participants would prefer. The key areas addressed were as follows:

- CONTROL: organization's approach to achieve what it wants
- AFFECT: manner in which the organization expresses caring and support
- CONTENT: description of the "essence" of the organization
- MEANING: organization's understanding of events and life situations
- WEIGHTS: comparative importance among characteristics.

Section III: Demographic Information – each participant indicated the following: current status at school:

student

staff

faculty

administrator

current status of student:

freshman: (quarters 1-3)

sophomore: (quarters 4-6)

junior: (quarters 7-9)

senior (quarters 10-12)

master's student (Argosy only)

doctoral student (Argosy only)

school affiliation:

The Art Institute of Phoenix or Argosy University-Phoenix

gender.

Participants' ages were requested on the consent form, which determined their eligibility to participate and informed the researcher of participants' ages of so that age-related categories could be reviewed.

Survey drafts were reviewed for clarity and errors by qualified adult colleagues at The Art Institute of Dallas and further reviewed by the researcher's academic advisor prior to electronic format transfer by a digital software company, SurveyMonkey. This software provides online access to researchers and respondents alike, while guaranteeing privacy and security through a secure

socket layer (SSL) that encrypts traffic between the website and the user's browser (Andrade, 2012). All data collected through SurveyMonkey can be stored in a variety of formats, including one that is consistent with IBM's Statistical Package for Social Sciences (SPSS) software. SPSS was employed to analyze this data.

Research Participants

The co-located organizations studied are corporate colleges, members of the same corporate-family, co-located into a single facility housing multiple disciplines, similar to those surveyed in the Dallas pilot study. Education Management Corporation (EDMC), a private corporation, operates the organizations selected, and began an initiative around 2003 to co-locate colleges from separate locations into a single facility in certain cities.

Co-located organizations in Phoenix, Arizona, The Art Institute of Phoenix and Argosy University – Phoenix, were chosen for study due to a similar organizational culture and similar comparative size of faculty, student and staff populations relative to the pilot study conducted in Dallas, Texas.

To provide participant context, The Art Institute of Phoenix offers a wide variety of applied arts programs including associate's degrees in Graphic Design, Culinary Arts and Baking and Pastry, as well as bachelor's degrees in Advertising, Graphic and Web Design, Interior Design, Photography, Digital Film,

Special Effects, Animation, Game Design, Game Programming, Fashion Design, Fashion Marketing, Culinary Management and Hospitality Food and Beverage Management. According to the Academic Catalog for the campus, “The mission of The Art Institute of Phoenix is to provide employers with quality skilled graduates prepared by experienced faculty using market-driven competency-based curricula” (“Academic Catalog,” 2015-2016). The following list of objectives are pursued to achieve the mission:

- “Involving employers in the development of curricula that is responsive to industry needs through Program Advisory Committees;
- Employing faculty who possess appropriate academic credentials, industry-related experience, and who exhibit excellence in teaching;
- Enhancing institutional effectiveness by consistently assessing and improving student retention, employment assistance, learning outcomes, and graduate and employer satisfaction;
- Fostering a culture of learning and collaboration that assures academic freedom, professional development and encourages responsible decision-making and critical thinking among students, faculty, and staff;
- Assisting graduates in obtaining career-related employment;
- Providing alumni with continuing educational opportunities; and,
- Serving the community as a creative and educational resource through the

active participation of students, faculty, and staff in a variety of outreach opportunities” (“Academic Catalog,” 2015-2016).

Argosy University-Phoenix offers bachelors, masters and doctoral programs in Clinical Psychology, Forensic Psychology, Industrial Organizational Psychology, Sports-Exercise Psychology and Clinical Mental Health Counseling. The college also offers various degrees in Education, Business Administration, Criminal Justice and Liberal Arts. The mission of this college, “At Argosy University, our passion is teaching and learning. We develop professional competence, provide opportunity for personal growth, and foster interpersonal effectiveness. Students succeed because our university community engages and supports them” (“Argosy University, History and Mission,”), as posted on the University’s webpage.

The table below provides population distributions for the two organizations at the time the survey was conducted:

TABLE 1: Population Characteristics for Sample Locations

COLLEGE	STUDENTS (n)	FACULTY (n)	STAFF (n)	TOTAL (n)
The Art Institute of Phoenix	980	105	60	1145
Argosy University - Phoenix	700	50	26	776
POPULATION TOTAL	1680	155	86	1921

Student populations of both colleges were between 85-90 percent of the

total population, resulting in the student sample sizes being proportionately larger than those of the faculty and staff. Additionally, the survey was a convenience sample whereby respondents voluntarily completed the survey at their own convenience. This type of sampling was utilized due to the ease of obtaining participants, the time involved, and the low cost compared to other techniques such as probability sampling ("Convenience Sampling," 2012).

A disadvantage of convenience sampling is no control of under- or over-representation of particular groups ("Convenience Sampling," 2012). The findings of this study will dictate the need for additional research as a result of this sampling procedure.

An incentive was offered to maximize participant response rate; it required those interested in the incentive to state their name and email address. This information was kept separate in the data stored on the SurveyMonkey site, which is only accessible through a password-protected account solely owned by the researcher.

The Dean of Academic Affairs at Argosy University – Phoenix sent the survey link to all students, faculty and staff. The Dean of Student Affairs of The Art Institute of Phoenix sent the email link to students; the Dean of Academic Affairs sent the email link to faculty and the college president sent the email link to staff. Flyers describing the survey with the link were also distributed in classrooms, student lounges and open computer labs.

Access to the survey was constrained to a two-week time period; it required approximately 15 minutes to complete. The overall number of responses was 237, although some items were designated for specific populations resulting in varying numbers of responses for those items.

Data Analysis

Section I: Responses to Section I – items 3 – 24 were coded to reflect numerical data for analysis.

All ***Very Strongly Disagree*** responses were coded 1,

Strongly Disagree responses were coded 2,

Disagree responses coded 3,

Agree responses were coded 4,

Strongly Agree responses were coded 5, and

Very Strongly Agree responses were coded 6.

The Staff and Administrators responses were merged into a single group, labeled Admin/Staff, due to the small number of responses from the two groups.

Small sample sizes caused the assumption of normal distributions to be questioned. Therefore, a decision was made to use the Wilcoxon Rank Sum Test, which assumes that data values are independent and that underlying

distributions are similar, but not necessarily normal.

A typical significance level in statistical analysis is 0.05, a 5 percent chance that the null hypothesis will be falsely rejected. According to Napierla, “The Bonferroni correction is used to reduce the chances of obtaining false-positive results (type I errors) when multiple pair wise tests are performed on a single set of data.” (Napierla, 2012). When a large number of hypotheses are tested simultaneously on a data set, one must reduce the statistical significance level in order to avoid type I errors. This is done by considering the typical significance level of 0.05 and multiplying it by the number of hypotheses (“GraphPad Statistics Guide,” 2014). Because each group, Faculty, Administration/Staff, and Student, in this study had 23 Wilcoxon Rank Sum tests to be completed, a Bonferroni corrected p-value of $0.05/23 = 0.002$ was applied.

Section II: Items 25 through 29 – analyzed using Multi-attribute Utility Theory (MAUT), which is a method of quantifying preferences of multi-attribute options (Sarin, 2013). In other words, MAUT can be used to translate an individual’s preferences into quantifiable data and allows for direct comparisons through rank orders (“Multi-Attribute Utility Theory (MAUT),” 2004). International in its usage, MAUT has long been utilized due to its applicability in planning (Dyer et al., 1992).

RESULTS

Introduction

The demographic and statistical survey results from The Art Institute of Phoenix and Argosy University - Phoenix include a sample of administration and staff, faculty and students from each institution. These findings are examined using the Wilcoxon Rank Sum test, and the Organization System Assessment Scale (OSAS), an organization system type preference measurement tool.

The study population and the two College samples' distributions are profiled by size, respondent status, college affiliation, level of schooling, and gender.

Demographic Profile

At the time of the survey in April 2014, the population of The Art Institute of Phoenix and Argosy University - Phoenix was (n=1921), divided among students (n=1680), faculty (n=155), and staff (n=86). The total number of survey respondents was (n=237), yielding a response rate of 12.3 percent.

The survey item regarding *College Affiliation*, which requested the participant to select The Art Institute of Phoenix or Argosy University - Phoenix, received 74 *no responses*.

Due to low response numbers from administrators in both Colleges, administration results were combined with staff results. The aggregated results are presented -- Argosy University: students (n=89), faculty (n=9) and admin/staff respondents (n=8); for The Art Institute: students (n=13), faculty (n=24) and admin/staff (n=20).

Table 2: Status Frequency Distribution by Number of Respondents (n)

	Argosy	Art Institute	Total
Student	89	13	102
Faculty	9	24	33
Admin/Staff	8	20	28
Total	106	57	163

The samples' demographic characteristics distribution were divided among students (n=102), faculty (n=33) and admin/staff (n=28) for a total of (n=163) complete responses regarding *Status*. However, the results regarding *College Affiliation* were slightly different between the two organizations: Argosy (n=108) and The Art Institute (n=57), and *no responses* (n=74), for a total of (n=237).

TABLE 3: College Affiliation Frequency Distribution by Number of Respondents (n)

	College Affiliation
Argosy	108
Art Institute	57
No response	74
Total	237

Students were asked to identify their *Level* in school. The sample total (n=102), was divided by campus as follows: Argosy -- *Freshman* (n=10), *Sophomore* (n=3), *Junior* (n=1), *Senior* (n=2), *Master's* (n=28) and *Doctoral* (n=45); Art Institute -- *Freshman* (n=6), *Sophomore* (n=2), *Junior* (n=3) and *Senior* (n = 2), (*Master's* and *Doctoral* programs are not offered at The Art Institute of Phoenix).

TABLE 4: Level Frequency Distribution by Number of Respondents (n)

	Argosy	Art Institute	Total
Freshman	10	6	16
Sophomore	3	2	5
Junior	1	3	4
Senior	2	2	4
Master's	28	n/a	28
Doctoral	45	n/a	45
Total	89	13	102

The *Gender* sample composition was 43 males (26.6%) and 119 females (73.5%), yielding a total of (n=162) respondents. The *Gender* distribution by college affiliation is presented in TABLE 5.

TABLE 5: College Affiliation and Gender Frequency Distribution by Number of Respondents (n)

	Male	Female	Total
Argosy	15	91	106
Art Institute	28	28	56
Total	43	119	162

Survey Instrument

The complete survey can be found in Appendix C. The Environmental Preference items (survey items 3 through 24), were coded as follows: *Very Strongly Disagree* = 1, *Strongly Disagree* = 2, *Disagree* = 3, *Agree* = 4, *Strongly*

Agree = 5, and Very Strongly Agree = 6.

As illustrated in Table 6, Environmental Preference Comparison by College, the number of responses varied depending on the Environmental Preference. The most significant variation can be observed in the Argosy responses to the items related to both classroom and office storage and space. Means from each college for each Environmental Preference were closely related between the two colleges, with the ranges also being somewhat similar. One exception was the minimum response difference for Rooms that Function Properly where Argosy exhibited at least one response of *Very Strongly Disagree = 1*, while The Art Institute's minimum response was *Agree = 4*. Additionally, all maximum responses were *Very Strongly Agree = 6* with the exception of *Strongly Agree = 5* from The Art Institute's responses for Flexible Classrooms.

TABLE 6: Environmental Preference Comparison by College

Environmental Preference	Argosy University-Phoenix				The Art Institute of Phoenix			
	(n)	Responses		Mean	(n)	Responses		Mean
		Minimum	Maximum			Minimum	Maximum	
Rooms that Function Properly	105	1	6	5.30	57	4	6	5.44
Having Privacy to do My Work	105	3	6	5.15	57	2	6	4.89
Adequate Space in Classroom	85	2	6	5.08	49	2	6	5.14
Adequate Storage in Classroom	65	2	6	4.06	38	1	6	4.47
Office Located Near Classrooms	30	3	6	4.17	33	1	6	4.03
Campus Aesthetics	106	1	6	4.49	57	1	6	4.58
Campus Security	106	2	6	5.31	57	1	6	5.14
Flexible Classrooms	106	1	6	3.90	57	1	5	3.79
Sustainable Building Materials	104	2	6	4.60	55	2	6	4.54
Acoustics	105	2	6	4.70	57	3	6	4.81
Segregating Classes by Organization	104	1	6	4.01	54	1	6	3.85
Co-mingling of Students	91	2	6	4.41	25	3	6	4.68
Co-mingling of Employees	29	3	6	4.76	44	1	6	4.34
Classroom Temperature Controls	104	2	6	5.13	55	3	6	4.89
Student Work Display Area for Each Organization	104	3	6	4.28	56	3	6	4.95
Natural Daylighting	98	3	6	4.98	49	3	6	4.82
Outside View	104	3	6	4.84	57	1	6	4.49
Appropriate Signage	105	2	6	4.53	57	1	6	4.70
Adjustable Classroom Lighting	105	3	6	4.72	56	3	6	4.88
Logo/Brand Location	101	2	6	4.32	56	2	6	4.55
Adequate Office Space	35	4	6	5.11	42	2	6	4.83
Adequate Office Storage	35	3	6	4.89	40	2	6	5.03
Multiple Security Checkpoints	86	2	6	3.80	41	2	6	3.72

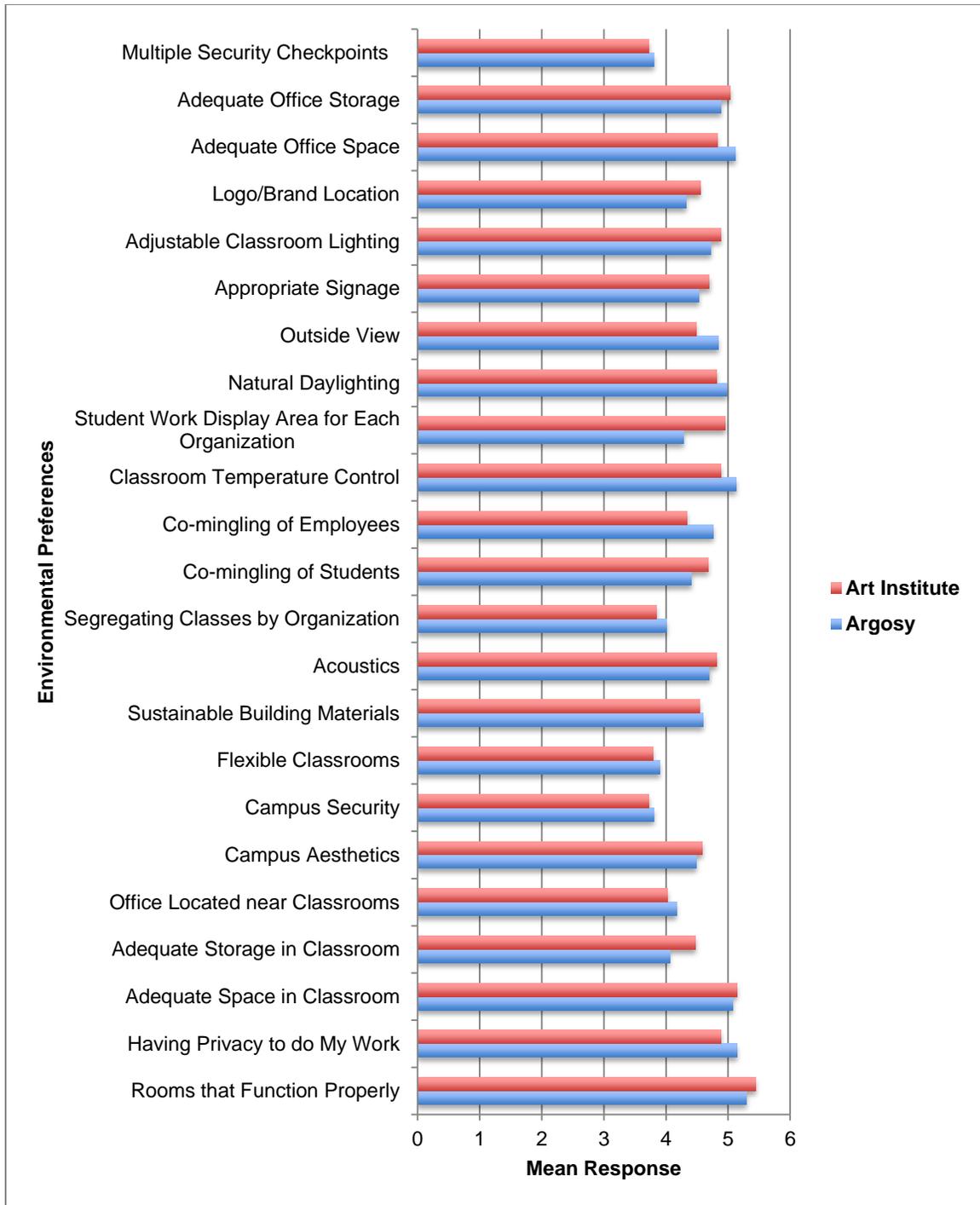


Figure 1: Sample Mean Environmental Preference Comparison by College

The Wilcoxon Rank Sum Test was applied to each of the 23 survey items

in this section and a Bonferroni corrected p-value of 0.002 was employed. The Wilcoxon Rank Sum test is a nonparametric alternative to the traditional Student t-test. Most commonly, it is used when the normality assumption of the t-test is suspect. The only necessary assumptions for this test are that the data values are independent and that they come from the same distribution.

This test is used to evaluate whether two distributions have the same center – it is a test of a location shift, similar to a t-test. The null and alternative hypotheses are often written as follows:

$$H_0 : M_1 = M_2 \quad H_a : M_1 \neq M_2$$

where M is typically the median. In order to calculate the value of the test statistic, all data values from both groups are first ranked from one to (n), where (n) is the total sample size from both groups. For example, if one group has eight survey responses and the second group has 12 survey responses, (n) would equal 20. If there is a tie between two or more data values, each data value is given the average rank. And, if the computed average is not a whole number, it is rounded up to the next whole number. The following illustration (TABLE 7) presents the process, wherein two groups are represented, noted in 'From' chart row, Group A and Group B:

TABLE 7: Example of a Wilcoxon Rank Sum Test

Data:	0	1	2	2	5	6	6	6	7	8	10	...
From:	A	B	A	B	A	A	B	B	B	A	B	...
1 to n:	1	2	3	4	5	6	7	8	9	10	11	...
Ranks:	1	2	3.5	3.5	5	7	7	7	9	10	11	...

The 'Data' indicates the survey responses. The data were ordered from least to greatest and 'Ranks' were assigned.

In this example, because the number two occurred twice in the data (a tie), rather than assigning it ranks three and four, it was assigned the average of those ranks, 3.5, for both instances. This same process was applied when the number six occurred as a three-way tie. As previously noted, whenever ties occurred, the number was rounded up to the next highest whole number.

Calculating the statistics involved four steps:

- 1) Sum the ranks from one of the groups;
- 2) Calculate the expected sum of the ranks for that group if the null hypothesis was true, i.e., the two groups had the same distribution with the same distribution center;
- 3) Calculate what the standard deviation of the ranks would be if the null hypothesis were true; and,

4) Insert the above values into the following formula to obtain a z-statistic:

$$z = \frac{T - E(T)}{SE(T)},$$
 where T is the number from step one, E(T) is the number

from step two, and SE(T) is the number from step three.

The z-statistic is used to identify the p-value by examining a standard normal table. If the p-value is small (<0.05), the data observed are not likely to have occurred by chance. Under this condition, the null hypothesis is rejected, concluding that the medians for the two groups are statistically different.

The data rankings, rather than raw data values, are used in the formula. If the groups are different, one would expect the ranks to be split, (e.g., one group would have all the smaller ranks and the other would have all the larger ranks; the implication being that all the smaller data values would have come from one group and all the larger data values from the other group. If there are no differences between groups, the ranks should be random. The mean or median is presented with its corresponding p-value to provide a broader analytical context. Because the group medians are similar, or identical for most of the items relative to the users' environmental preferences for both campus samples, the two Colleges appear to be relatively congruent – no statistical differences were identified.

Sample Comparison

Preference incongruences can occur in one of four conditions:

- (1) Organization A rates a preference as *very strongly agree* and organization B rates the same preference as *very strongly disagree*;
- (2) Organization A rates a preference as *very strongly disagree* and organization B rates the same preference as *very strongly agree*;
- (3) Organization A rates a preference as *strongly agree* and organization B rates the same preference as *very strongly agree*; and,
- (4) Organization B rates a preference as *strongly agree* and organization A rates the same preference as *very strongly agree*.

Of these four conditions, Conditions (1) and (2) possess the most ***serious incongruences***, and are strong indicators of poor co-location fit. The higher the number of these types of incongruences among the Environmental Preferences items, the more difficult co-location may be to implement. Conditions (3) and (4) are also preference incongruences, but are more easily accommodated because both organizations feel the preferences are either important or unimportant and only marginally differ in their degree of importance.

Table 8 presents the 23 Environmental Preferences for both organization samples. In an analysis examining environmental preferences that are congruent (the best indicators of successful co-location), Argosy and The Art Institute agree on 65 percent of the items' degrees of importance. Further, the results indicate

that all of the remaining environmental preferences fall into the Condition (3) and (4) categories – Argosy reported that four of the preferences are more important than did the Art Institute, and the Art Institute reported that four of the preferences were more important than did Argosy. Both campuses are in complete agreement with 15 of the preferences, and no occurrences of categories Conditions (1) and (2) were found.

The Environmental Preferences identified as more important for Argosy included *outside views, co-mingling of employees, campus security, and sustainable building materials*, possibly due to the predominance of faculty and students from the Psychology department at Argosy and their understanding of biophilia, collaboration and the human need for safety and security. Additionally, a recent bomb threat on campus put everyone on alert; hence the preference for high importance of campus security.

The Art Institute offers only programs in the applied arts, so there is a genuine need to display student projects, such as interior design and fashion trend boards, graphic design ad campaigns, etc. High-technology use among The Art Institute students resulted in higher environmental preference reports than reported by Argosy including: *a student work display area for each organization, appropriate signage, co-mingling of students, and rooms that function properly*. It is reiterated here that the incongruences are marginal differences in degree of importance – both organizations responded that these preferences were *important*.

It has been suggested that the preference of *student work display area for each organization* could be related to 'identity'. *Logo/Brand Location* might also be considered to be 'identity.' Or, the statistically significant finding of *student work display area for each organization* could simply be that students enjoy having their work displayed to validate their own skills, while instructors like showing the positive course outcomes of their classes, and, the administration likes displaying student work to show prospective students what to expect in the classrooms. These suggestions are speculative without additional research into the 'why' of this finding.

TABLE 8: Sample Frequency Distribution Comparison Analysis Ranked by Environmental Preference Using Wilcoxon Sum Rank

RANK	ENVIRONMENTAL PREFERENCE	Argosy Median Value	Art Institute Median Value	(p-value)	Argosy More Important	Art Institute More Important	Argosy/Art Institute Similar	Statistically Significant
1	Student Work Display Area for Each Organization	5	6	0.0001		X		YES*
2	Adequate Storage in Classroom	4	4	0.0404			X	NO
3	Outside View	5	4	0.0470	X			NO
4	Having Privacy to do My Work	5	5	0.0700			X	NO
5	Co-mingling of Employees	5	4	0.0830	X			NO
6	Classroom Temperature Controls	5	5	0.0930			X	NO
7	Appropriate Signage	4	5	0.0982		X		NO
8	Flexible Classrooms	4	4	0.1616			X	NO
9	Logo/Brand Location	4	4	0.2127			X	NO
10	Co-mingling of Students	4	5	0.2484		X		NO
11	Natural Daylighting	5	5	0.3040			X	NO
12	Adequate Office Space	5	5	0.3154			X	NO
13	Segregating Classes by Organization	4	4	0.3173			X	NO
14	Adjustable Classroom Lighting	5	5	0.3505			X	NO
15	Adequate Office Storage	5	5	0.4163			X	NO
16	Campus Security	6	5	0.4730	X			NO
17	Campus Aesthetics	4	4	0.4970			X	NO
18	Acoustics	5	5	0.5386			X	NO
19	Adequate Space in Classroom	5	5	0.5420			X	NO
20	Rooms that Function Properly	5	6	0.6140		X		NO
21	Office Located Near Classrooms	4	4	0.6410			X	NO
22	Sustainable Building Materials	5	4	0.7833	X			NO
23	Multiple Security Checkpoints	4	4	0.9570			X	NO

* Statistical significance cut-off point = (p-value) < .0002

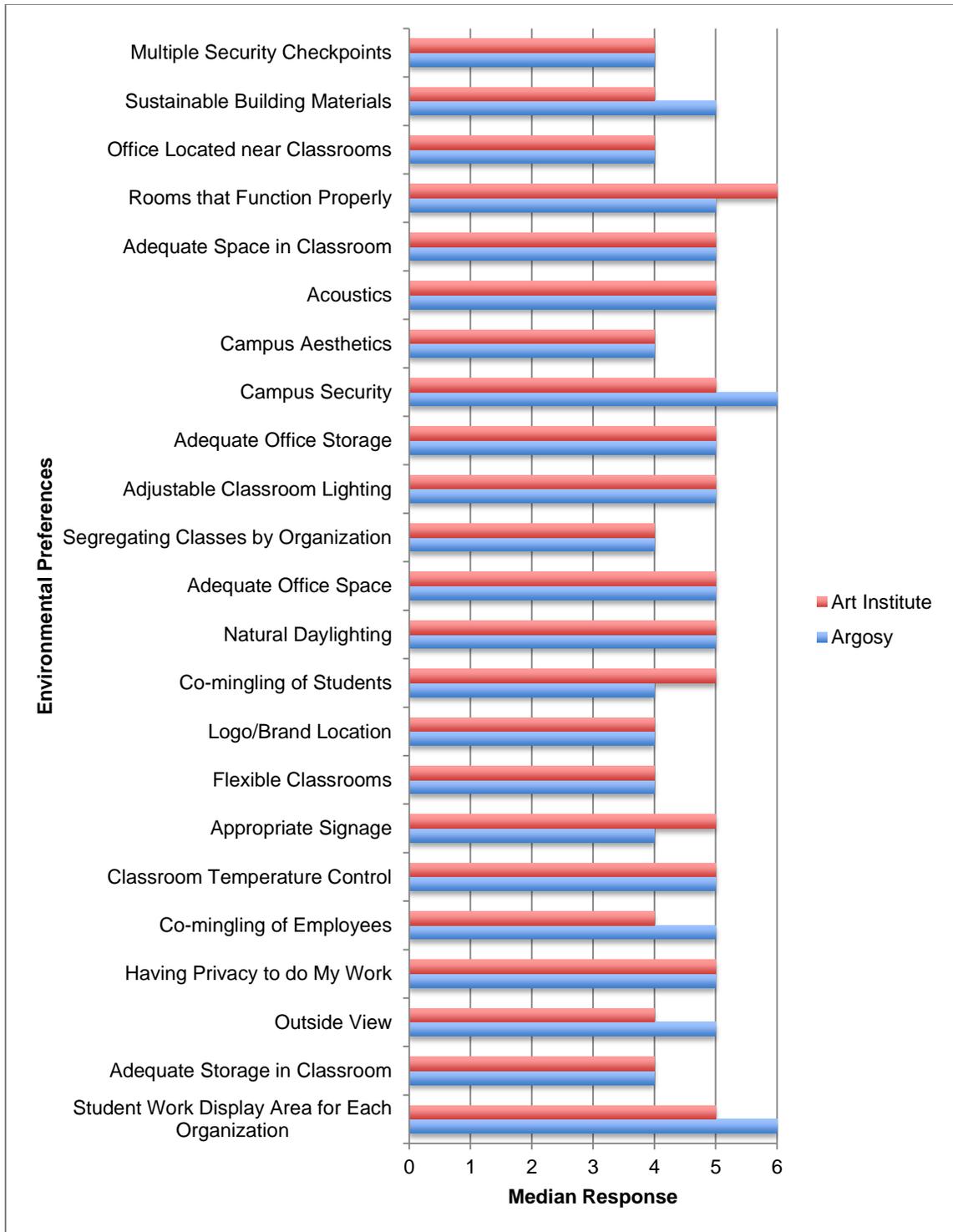


FIGURE 2: Sample Median Response Comparison between Organizations Administration/Staff Frequency Distribution Comparison

As noted in the Sample Distribution Comparison, Conditions (1) and (2) are ***serious incongruences*** and indicate poor co-location fit. On the other hand, Conditions (3) and (4) are important incongruences, but are more easily addressed and compromises employed because both organizations feel the items are either important or unimportant and only marginally differ in their degree of importance. It should be noted that there were no examples of Conditions (1) and (2) in the comparison of the Administration/Staff distribution, similar to the Sample distribution comparison.

The 23 Environmental Preference items for the combined Administration and Staff for both organizations are presented in Table 9 below. Argosy and The Art Institute administrators and staff agree on 57 percent of all the items. The results further indicate that all of the remaining items fall into the Condition (3) and (4) categories, with Argosy reporting seven of the items more important than The Art Institute; The Art Institute reported one of the items was more important than Argosy.

Again, these incongruences are only marginally different in their degree of importance; both organizations reported these preferences were important.

TABLE 9: Administration/Staff Frequency Distribution Comparison Ranked by Environmental Preferences Using Wilcoxon Sum Rank

RANK	ENVIRONMENTAL PREFERENCE	Argosy Median Value	Art Institute Median Value	(p-value)	Argosy More Important	Art Institute More Important	Argosy/Art Institute Similar	Statistically Significant
1	Logo/Brand Location	6	4	0.0053	X			NO
2	Segregating Classes by Organization	5	4	0.0790	X			NO
3	Outside View	5	5	0.1080			X	NO
4	Classroom Temperature Controls	5	4	0.1242	X			NO
5	Adequate Office Storage	5	5	0.1798			X	NO
6	Campus Aesthetics	5	4	0.2201	X			NO
7	Co-mingling of Employees	5	4	0.2634	X			NO
8	Office Located Near Classrooms	3	4	0.5392		X		NO
9	Multiple Security Checkpoints	4	4	0.6091			X	NO
10	Flexible Classrooms	5	4	0.6412	X			NO
11	Acoustics	5	5	0.6821			X	NO
12	Adequate Office Space	5	5	0.7352			X	NO
13	Appropriate Signage	5	5	0.7647			X	NO
14	Sustainable Building Materials	5	4	0.7655	X			NO
15	Student Work Display Area for Each Organization	5	4	0.8513	X			NO
16	Co-mingling of Students	4	4	0.8704			X	NO
17	Adjustable Classroom Lighting	5	4	0.8726	X			NO
18	Campus Security	6	6	0.8866			X	NO
19	Rooms that Function Properly	5	5	0.8879			X	NO
20	Natural Daylighting	5	5	0.8985			X	NO
21	Adequate Storage in Classroom	5	5	0.9014			X	NO
22-tie	Adequate Space in Classroom	5	5	1.0000			X	NO
22-tie	Having Privacy to do My Work	5	5	1.0000			X	NO

* Statistical significance cut-off point = (p-value) < .0002

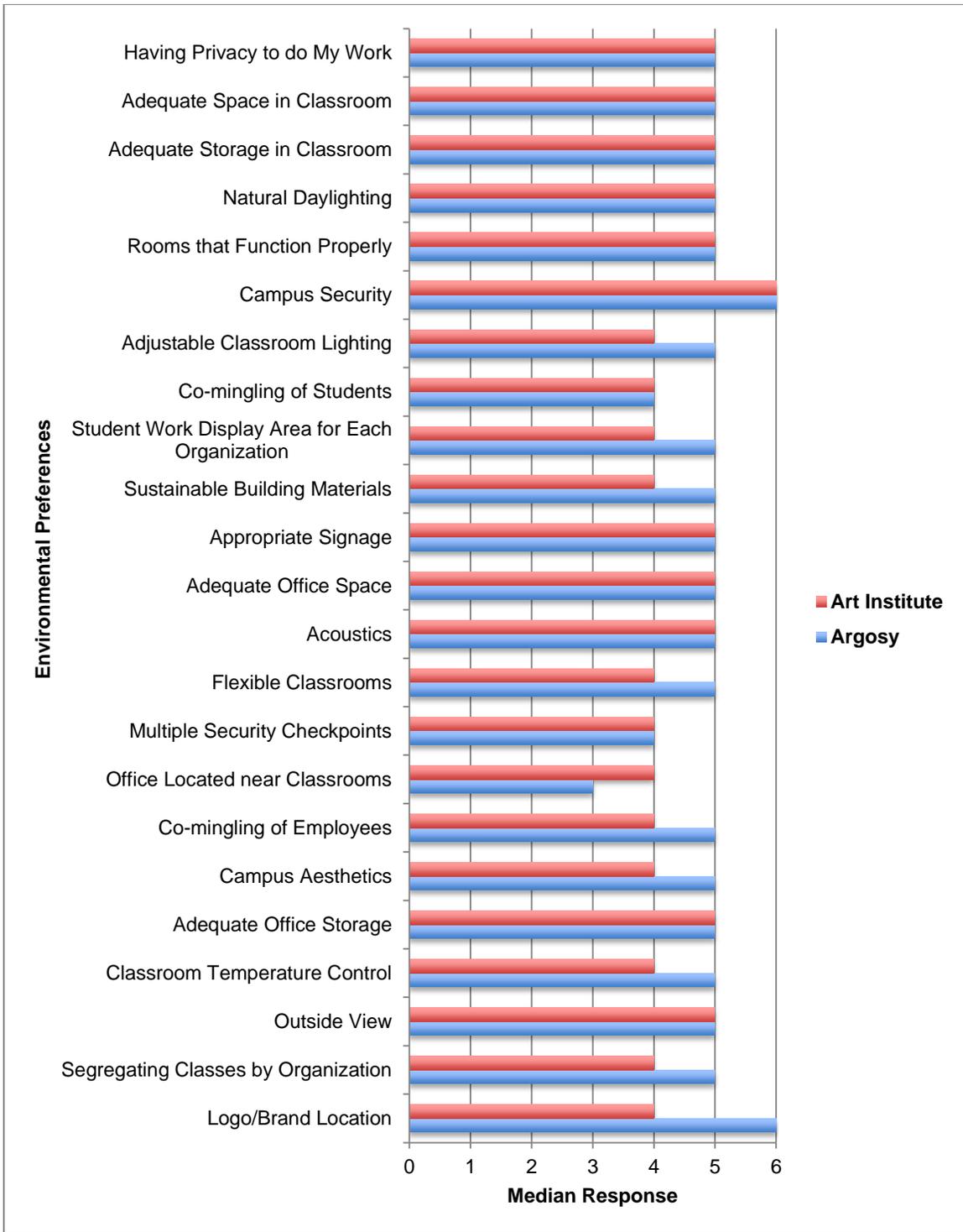


FIGURE 3: Administration/Staff Median Environmental Preference Comparison by Organization

Faculty Distribution Comparison

Similar to the results in the Sample Comparison among Environmental Preference items in the survey, the Argosy Faculty group rated *outside view, flexible classrooms, sustainable building materials, adequate office space, adequate office storage, co-mingling of students, acoustics, campus security, co-mingling of employees, campus aesthetics, and logo/brand location* as more important than did the Art Institute Faculty.

Table 10 illustrates points of agreement between the two colleges on 44 percent of the items' degrees of importance. The remaining items fall into the Condition (3) and (4) categories, with marginal differences in level of importance. Again, there were no occurrences of Condition (1) and (2) categories.

TABLE 10: Faculty Frequency Distribution Comparison Analysis Ranked by Environmental Preference using Wilcoxon Sum Rank Test

RANK	ENVIRONMENTAL PREFERENCE	Argosy Median Value	Art Institute Median Value	(p-value)	Argosy More Important	Art Institute More Important	Argosy/Art Institute Similar	Statistically Significant
1	Outside View	6	4	0.0062	X			NO
2	Flexible Classrooms	5	4	0.0106	X			NO
3	Sustainable Building Materials	5	4	0.0173	X			NO
4	Adequate Office Space	6	5	0.0305	X			NO
5	Student Work Display Area for Each Organization	4	5	0.0551		X		NO
6	Adequate Office Storage	6	5	0.0829	X			NO
7	Having Privacy to do My Work	5	5	0.1264			X	NO
8	Co-mingling of Students	6	4	0.1432	X			NO
9	Natural Daylighting	5	5	0.1567			X	NO
10	Classroom Temperature Controls	6	5	0.2090	X			NO
11	Adjustable Classroom Lighting	5	5	0.2215			X	NO
12	Adequate Storage in Classroom	4	4	0.2241			X	NO
13	Acoustics	5	4	0.2672	X			NO
14	Segregating Classes by Organization	4	4	0.2738			X	NO
15	Campus Security	6	5	0.2989	X			NO
16	Co-mingling of Employees	5	4	0.3455	X			NO
17	Campus Aesthetics	6	5	0.5513	X			NO
18	Logo/Brand Location	5	4	0.5919	X			NO
19	Appropriate Signage	5	5	0.6232			X	NO
20	Multiple Security Checkpoints	4	4	0.7233			X	NO
21	Office Located Near Classrooms	4	4	0.7496			X	NO
22	Adequate Space in Classroom	5	5	0.8052			X	NO
23	Rooms that Function Properly	6	6	0.9815			X	NO

* Statistical significance cut-off point = (p-value) < .0002

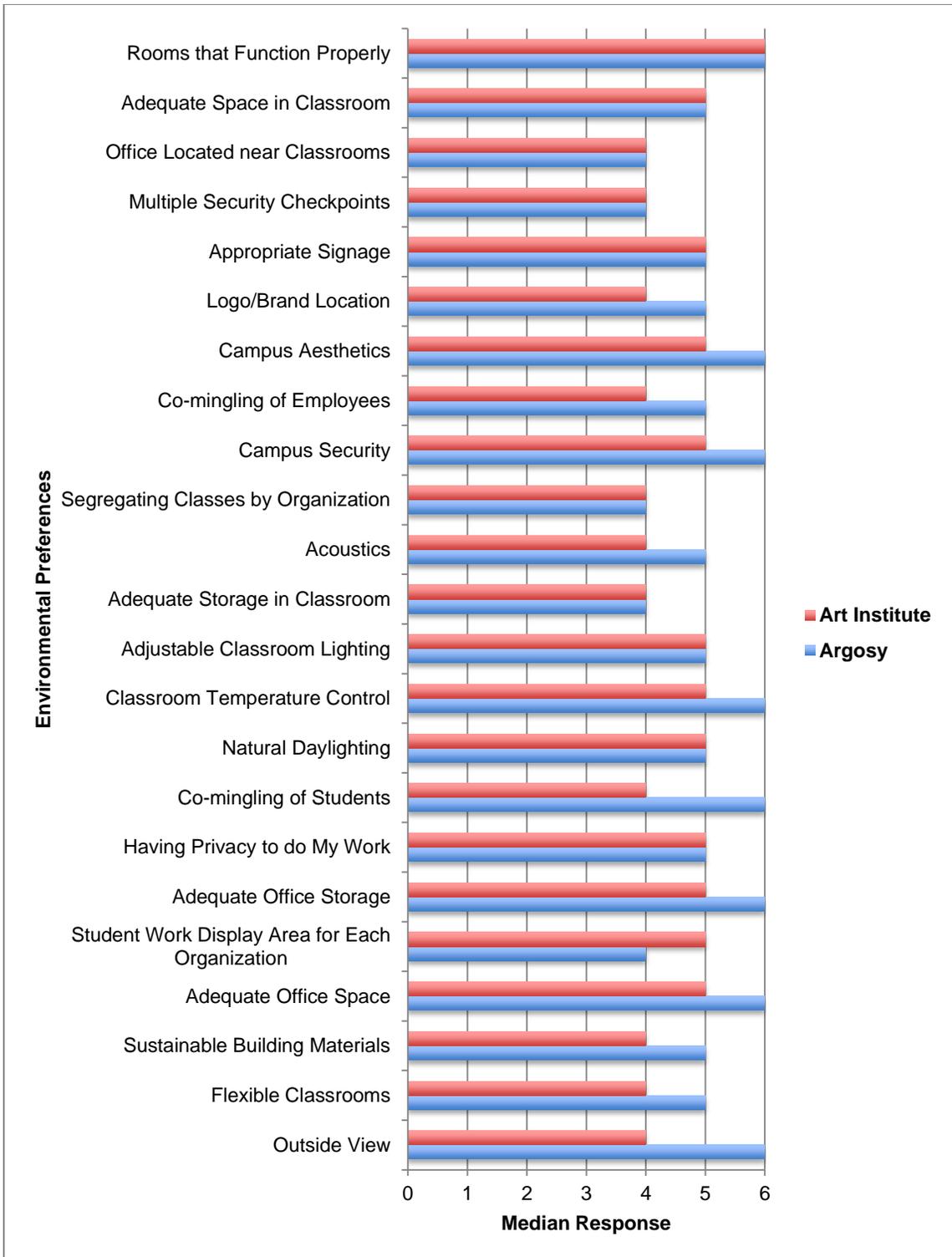


FIGURE 4: Faculty Median Environmental Preference Comparison by Organization

Student Distribution Comparison

Argosy Students responded almost seven times more frequently than The Art Institute, but the Argosy group failed to identify any of the Environmental Preferences as 'more important' than The Art Institute. The Art Institute Students favored *student work display area for each organization, logo/brand location, adequate storage in classroom, sustainable building materials, adequate office space, office located near classrooms, co-mingling of employees, appropriate signage and classroom temperature controls*, causing these items to fall in the Condition (3) and (4) categories. The differences between campuses are marginal, and both campuses' Students viewed them as important. Nevertheless, the two groups agreed on 61 percent of the Environmental Preference items' importance level.

Once again, no occurrences of Condition (1) and (2) categories were discovered. These results are presented in Table 11.

TABLE 11: Student Frequency Distribution Comparison Analyses Ranked by Environmental Preference Using Wilcoxon Sum Rank Test

RANK	ENVIRONMENTAL PREFERENCE	Argosy Median Value	Art Institute Median Value	(p-value)	Argosy More Important	Art Institute More Important	Argosy/Art Institute Similar	Statistically Significant
1	Student Work Display Area for Each Organization	4	5	0.0019		X		NO
2	Logo/Brand Location	4	5	0.0153		X		NO
3	Adequate Storage in Classroom	4	5	0.0226		X		NO
4	Sustainable Building Materials	4	5	0.0799		X		NO
5	Adequate Office Space	5	6	0.0934		X		NO
6	Acoustics	5	5	0.2296			X	NO
7	Office Located Near Classrooms	4	5	0.2402		X		NO
8	Campus Aesthetics	4	4	0.2680			X	NO
9	Co-mingling of Employees	5	6	0.2784		X		NO
10	Appropriate Signage	4	5	0.2985		X		NO
11	Outside View	5	5	0.3662			X	NO
12	Co-mingling of Students	4	4	0.3710			X	NO
13	Rooms that Function Properly	6	6	0.4151			X	NO
14	Adequate Office Storage	5	5	0.4163			X	NO
15	Natural Daylighting	5	5	0.4481			X	NO
16	Segregating Classes by Organization	4	4	0.5581			X	NO
17	Adequate Space in Classroom	5	5	0.5823			X	NO
18	Multiple Security Checkpoints	4	4	0.6055			X	NO
19	Classroom Temperature Controls	5	6	0.6713		X		NO
20	Having Privacy to do My Work	5	5	0.7535			X	NO
21	Campus Security	6	6	0.7790			X	NO
22	Flexible Classrooms	4	4	0.8807			X	NO
23	Adjustable Classroom Lighting	5	5	0.8817			X	NO

* Statistical significance cut-off point = (p-value) < .0002

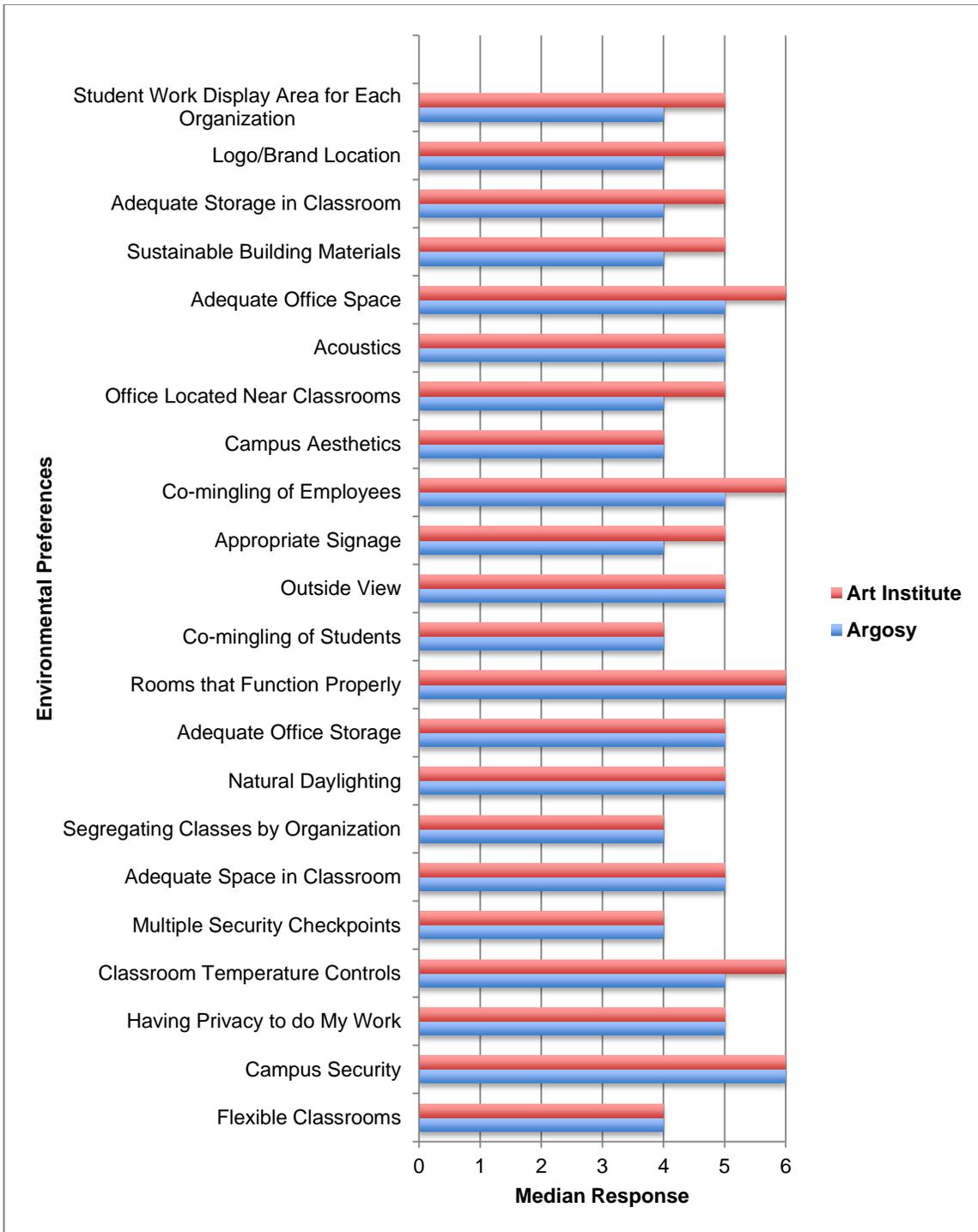


FIGURE 5: Student Median Environmental Preference Comparison by Organization

Organization System Assessment

The Organization System Assessment Scale (OSAS) was developed by Phillips (2014). It was employed in this research as a complementary technique addressing co-location compatibility or congruence. Based on a previous version, the Organizational Regime Assessment Scale, this scale, according to Phillips (2012) "...uses the index construction algorithm for each of the system types for IDEAL and ACTUAL conditions as follows:

The CLOSED Index Value =

((CLOSED response for the AFFECT dimension) added to
(CLOSED response for the CONTROL dimension) added to
(CLOSED response for the MEANING dimension) added to
(CLOSED response for the CONTENT dimension)) multiplied by
(Response for the AFFECT dimension)

The OPEN Index Value =

((OPEN response for the AFFECT dimension) added to
(OPEN response for the CONTROL dimension) added to

(OPEN response for the MEANING dimension) added to
(OPEN response for the CONTENT dimension)) multiplied by
(response for the CONTROL dimension)

The RANDOM Index Value =

((RANDOM response for the AFFECT dimension) added to
(RANDOM response for the CONTROL dimension) added to
(RANDOM response for the CONTENT dimension)) multiplied by
(response for the MEANING dimension)

The SYNCHRONOUS Index Value =

((SYNCHRONOUS response for the AFFECT dimension) added to
(SYNCHRONOUS response for the CONTROL dimension) added to
(SYNCHRONOUS response for the MEANING dimension) added to
(SYNCHRONOUS response for the CONTENT dimension)) multiplied by
(response for the CONTENT dimension).”

Each of the four survey items and the weighted survey item ranged between 0 – 10. The maximum possible Index Value is computed to be 400. These Index Values are noted as their arithmetic total as well as a percent of 400. Thus, a weighted Index Value across the four organization systems dimensions results in an Index value – a percent of the maximum weighted Index Value of 400. Both the IDEAL and the ACTUAL perceptions of the respondents and the differences between the IDEAL and the ACTUAL Index Values are presented.

To fully understand the dimensions and constructs of the OSAS, Figure 1 is adapted from the information Phillips (2014) provided in his report to University of Missouri Extension. He explained that there are “four archetypal organization system types” (Phillips, 2014). At the top of the vertical axis is the *Closed* type, or “Thesis”, while at the bottom is the *Random* type, or “Antithesis.” Horizontally, the *Open*, or “Synthesis”, appears on the left, while the *Synchronous*, or “Anti-synthesis” is located on the right (Phillips, 2014). Figure 1 below also cites the characteristics of these organization types. In the case of co-located colleges, similarity of organization system types will ensure the success of the shared space and/or services, if applicable.

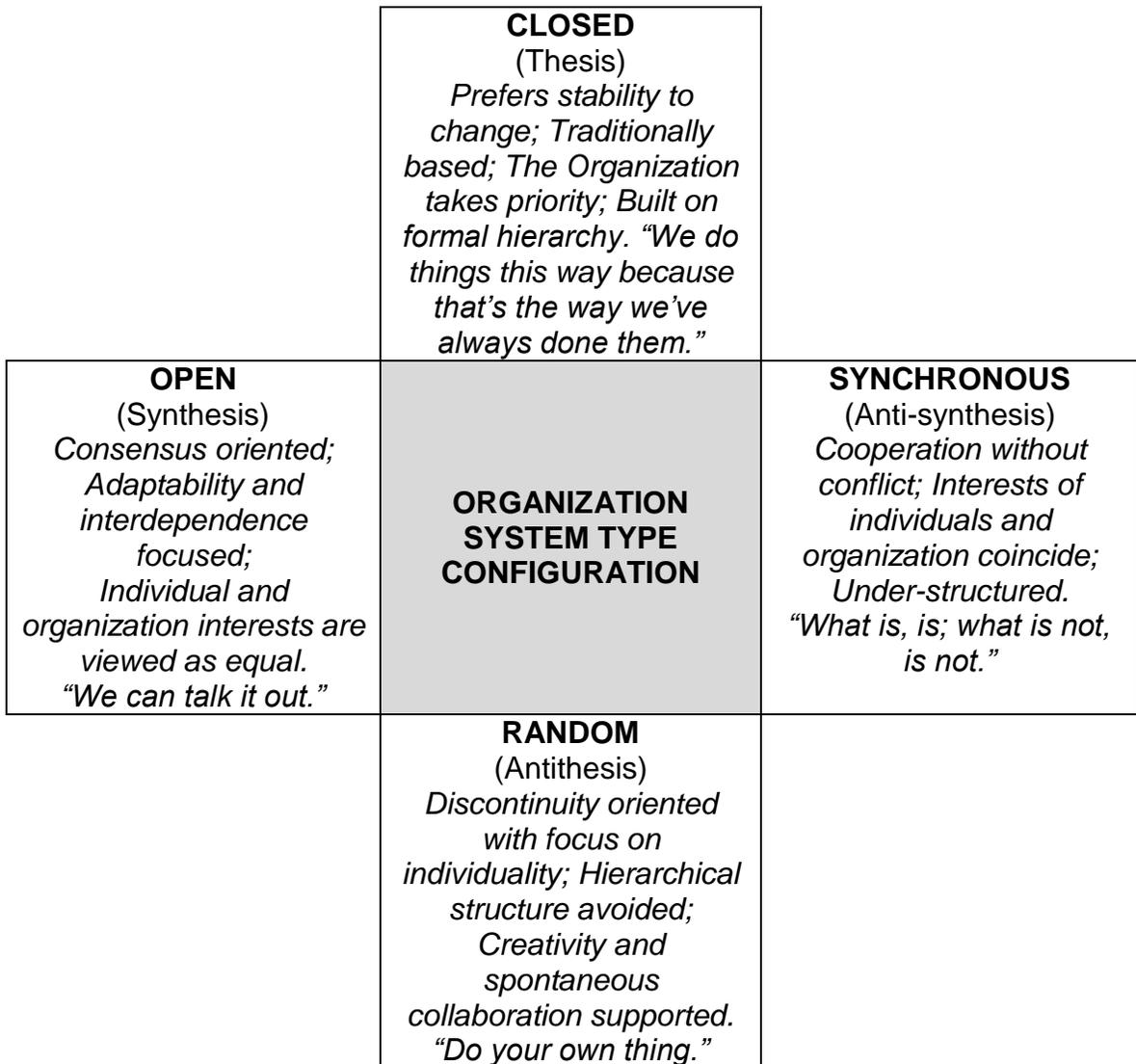


FIGURE 6: Organization System Type Configuration with Description

TABLE 12: By School Percent Distribution Comparison for Organization System Type Index (IDEAL)

IDEAL Organization System Type	Argosy	Art Institute
CLOSED	13.5	13.8
OPEN	10.1	9.8
RANDOM	35.2	33.0
SYNCHRONOUS	40.1	45.0

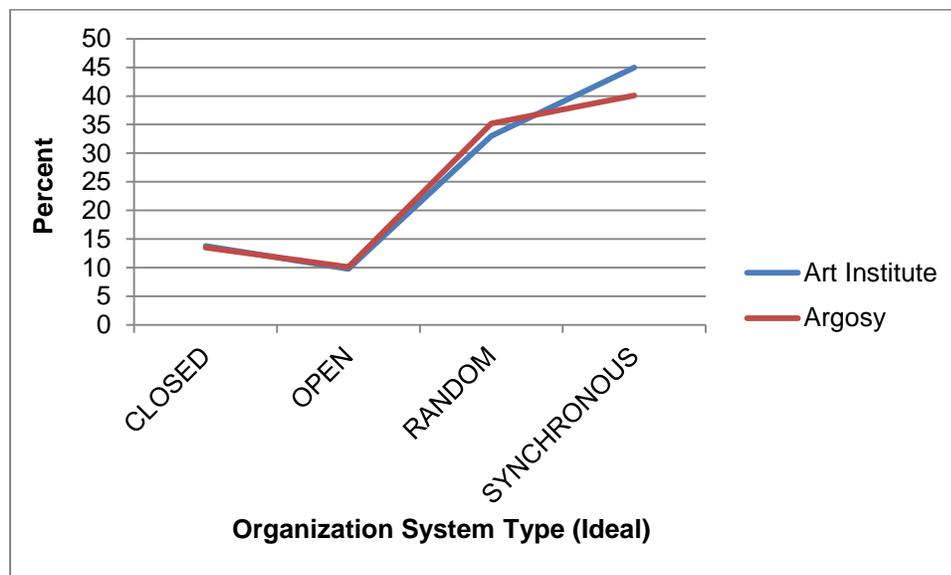


FIGURE 7: By School Percent Distribution Comparison for Organization System Type Index (IDEAL)

Table 12 above illustrates the similarity of OSAS types between the two organizations. While there appears to be some variation within system types, the

differences are minimal. Moreover, searching for an emerging pattern, the similarity of IDEAL OSAS system types is pronounced.

TABLE 13: By School Percent Distribution Comparison for Organization System Type Index (ACTUAL)

ACTUAL Organization System	Argosy	Art Institute
CLOSED	28.4	45.8
OPEN	31.2	31.0
RANDOM	16.0	11.0
SYNCHRONOUS	14.3	15.9

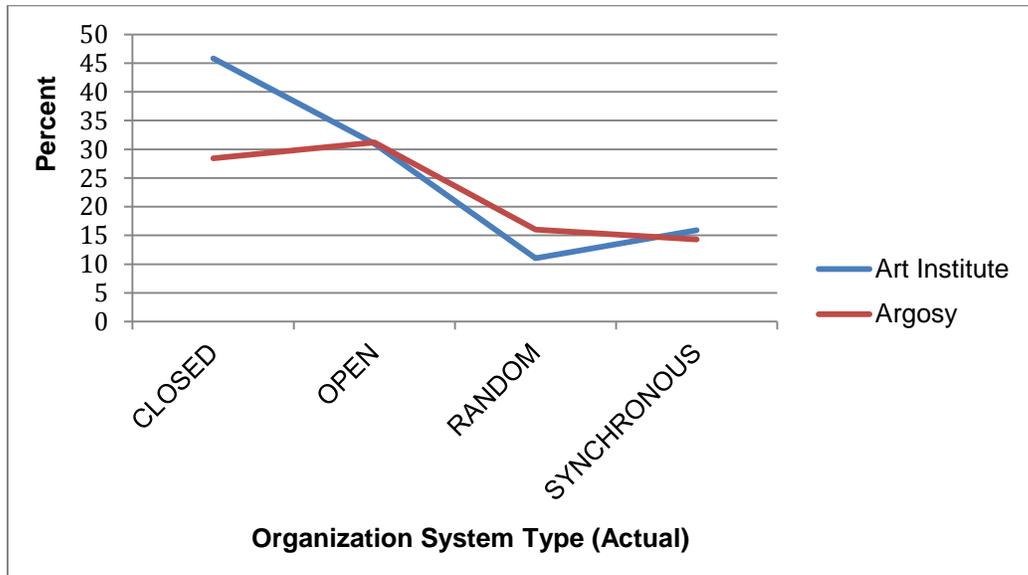


FIGURE 8: By School Percent Distribution Comparison for Organization System Type Index (ACTUAL)

The ACTUAL perceptions between organizations, as was the case for the IDEAL perceptions, indicate a striking similarity of system type Index values. The

exception to this pattern is The Art Institute response that the organization is more *Closed* than Argosy's responses, a noticeable difference, but still marginal.

TABLE 14: Percent Differences Among Organization System Type INDEX by School (IDEAL-ACTUAL)

Difference Organization System INDEX (IDEAL-ACTUAL)	Argosy	Art Institute
CLOSED	-14.9	-32.0
OPEN	-21.1	-21.2
RANDOM	19.2	22.0
SYNCHRONOUS	25.8	29.1

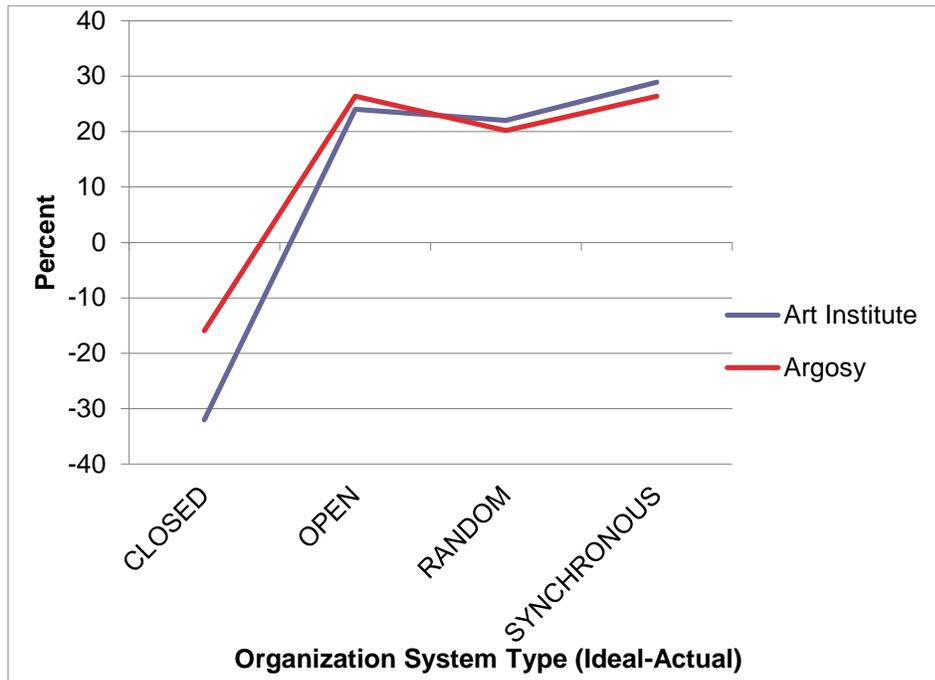


FIGURE 9: Difference Organization System Type INDEX by School (IDEAL-ACTUAL)

Perceptions reported in the Difference Organization System Type Index (IDEAL-ACTUAL) indicate similar Index values to OSAS results – The Art Institute results continue to indicate it is more *Closed* than the results obtained from Argosy. However, that difference is considered to be minimal, as it is less than 50 percent.

Education Management Corporation (EDMC) is the parent company for both The Art Institute and Argosy University nationwide so similar corporate cultures, or cultural homogeneity, might be expected. EDMC's website states, "...Our schools are dedicated to giving students the tools, skills and confidence they need for a lifetime of success. From preparing graduates into their first, exciting foray into the business world to helping busy professionals broaden their career possibilities, we provide flexible curriculum and scheduling, smaller classes with hands-on instruction and abundant personal attention, and most importantly, a practical education" ("Education Management Corporation (EDMC)," 2015).

Summary

Among the 23 Environmental Preference survey items, all were ranked as important, either in complete agreement or in varying degrees of agreement,

presenting very few statistically relevant differences between Argosy and The Art Institute. Interestingly, in the top 10 rankings of both schools, each of the three groups – Administration/Staff, Faculty and Students –determined that 1) *student work display area*, 2) *outside views*, 3) *flexible classrooms*, and 4) *logo/brand location* were all preferred.

The results also indicate that each of the 23 Environmental Preferences should be considered when designing a co-located site for two or more colleges. With only one of 23 environmental preferences yielding a statistically significant value (<0.002), the result is 96 percent congruency in regards to the environmental preference measure. With the OSAS pattern being identical between the two organizations (SYNCHRONOUS, RANDOM, CLOSED, OPEN), the largest difference on the OSAS type index – IDEAL appearing in the SYNCHRONOUS Type is slightly less than five percent, which results in 95 percent congruence. Based on the three components of successful co-location measurement, this specific co-location of two corporate colleges is considered successful.

DISCUSSION

Introduction

The goal of co-location is to create congruence between the environmental preferences of two organizations, based on the assumption that an environment designed to include the shared preferences of both groups will provide for both, allowing the organizations to be equals in the partnership.

The environmental preferences thought to impact productivity, safety, and work satisfaction were compared between two co-located college user groups. The Dallas pilot project, administered to administration and staff, faculty, and students, identified the environmental preference constructs for the co-located entities within the Phoenix study.

Overall, the success of co-location largely depends on two principles, the similarities of each organization's missions and systems, which is an important factor in organizational co-location compatibility, and during the design programming phase, employee preferences for existing and ideal attributes must be determined. When OSAS results are homogenous between two organizations, co-location success is higher than when OSAS patterns diverge. Organization systems compatibility is an essential component in successful co-location.

Interpretation of Environmental Preference Survey Responses

The Organization System Assessment Scale (OSAS) proved to be a valuable tool for identifying the similarities between Argosy and The Art Institute in the Phoenix study.

The study showed that co-location may result in economic efficiency, or cost savings of shared applicable resources, as well as reducing environmental impacts, while offering the opportunity for beneficial face-to-face interactions and collaborations between the two organizations. In addition, classrooms designed to be flexible can serve a variety of different class types, whether lab or lecture.

The physical spaces of The Art Institute and Phoenix to Argosy differ in two important ways: 1) the designated space assigned to Argosy is significantly smaller than that assigned to The Art Institute; and, 2) Argosy primarily uses lecture-type classrooms, while The Art Institute classrooms are geared primarily to studio/lab space.

Therefore, the interpretation of Argosy administration/staff resulted in the following areas receiving the response 'more important'. Each item is compared with circumstances at The Art Institute.

Logo/brand location: the Argosy logo was displayed on their assigned floor, at the counseling center and on the building's exterior, but not incorporated into the student lounge/snack bar area – an area shared by both organizations, and which displays The Art Institute's logo.

Classrooms segregated by organization: Argosy lecture classes typically require a comfortable environment that provides appropriate temperature and lighting for viewing slides or other lecture materials. Therefore, The Art Institute's film, audio and/or animation classes could become disruptive when held in close proximity to Argosy lecture classes.

Student work display areas for each organization: Only three student displays were observed on the Argosy floor, and they were filled with student awards and notices regarding student organizations, rather than student work. The Art Institute responded 'more important' in this area as well, possibly due to the high number of applied arts projects within each course.

The Art Institute administration/staff responses that were 'more important' environmental preferences than Argosy:

Office Located Near Classroom: keeping in mind that The Art Institute resides on several floors in their building, the administration/staff responded that it would be beneficial to have offices in close proximity to student classrooms, presumably because The Art Institute faculty are required to transport many supplies to the classroom when they teach hands-skills classes.

Campus Security and Multiple Security Checkpoints: though this ranked highest at The Art Institute, high ratings from both organizations may be a result of a bomb scare that occurred a few months before the survey was conducted,

as the co-located campus appears to be within a safe environment, with other colleges located within close proximity.

Considerations of Co-location for each Organization

Flexible classrooms: The ability to teach small or large classes, or varying types of classes, within a space through the use of dividers, technology and easily movable furnishings would provide the most flexibility for Argosy and positively impact the fiscal bottom line for the campus.

Certain responses are likely dependent on primary subjects at each organization. For example, enrollment in Argosy's Psychology department, which appeared to be the predominant major among those who responded to the survey, and emphasize biophilia and sustainability – providing a natural leaning toward the importance of 'sustainable building materials' and 'collaboration' and 'the human need for safety and security'. Along the same lines, Argosy faculty favored 'outside views', 'sustainable building materials', 'classroom temperature controls', 'acoustics', and 'campus security'.

Further, Argosy graduate faculties perform advising duties and require private offices. Therefore, the favored preferences of 'adequate office space' and 'adequate office storage' seem reasonable.

The Art Institute faculty emphasized the need for independent student display areas for each organization. Both art foundations classes and studio classes within each program exhibit student work, promoting the variety of majors available to students.

Student Responses

Overall, fewer students responded to the survey than Administration/Staff or Faculty. Argosy students responded in greater numbers, which may be attributable to the Argosy curriculum in biophilia psychology. Biophilia students have a natural interest in the environment as it affects all sentient life, and vice versa. The Argosy student experience takes place in lecture halls.

Students of The Art Institute answered the survey in fewer numbers, but their responses were more definitive – stronger opinions were offered. As students of the built environment, their responses were directly related to the study of design, as well as the difference in educational experience, which is hands-skill oriented.

The top three survey items for The Art Institute students included: ‘student work display area for each organization’ – possibly due to the high number of applied arts projects within each course; ‘logo/brand location’ – possibly due to campus pride; and ‘adequate storage in classroom’ – possibly due to none being observed for student use.

The top three survey items for Argosy students included: 'acoustics' – possibly for noise control from hallways and other classrooms; 'campus aesthetics' – possibly due to campus pride; and 'outside views' – possibly for the innate human need to be connected to nature.

Argosy students did not rate any survey items higher than The Art Institute students.

Application of Findings

When considering co-location, the organizations involved would benefit from an assessment to determine if co-location is a good fit for their organizations. To help determine this, a two-step process would provide necessary information. First, it must be determined that the organizations have similar perceptions of their own missions and systems, as these similarities are a requirement for successful co-location. An employee survey can be administered using the Organization System Assessment Scale (OSAS) that identifies individuals' perceptions, resulting in an assignment of Organization System Type preferences.

Second, as part of the design programming stage conducted by the architects and interior designers, employees should be surveyed to determine their existing and ideal environmental preferences before designers begin to create spaces without a functional knowledge of the preferences.

Christopher Alexander, in his book, *A Pattern Language* (Alexander et al., 1977), states, “Each pattern describes a problem which occurs over and over again in our environment, and then describes the core of the solution to that problem, in such a way that you can use this solution a million times over, without ever doing it the same way twice.” In a spirit similar to Alexander’s, sample preferences can be sorted into three distinct groups, according to results from the Phoenix study: Classrooms, Segregation of Organizations, and Environment. Proposed co-located campus designers will find this method useful, as will those wishing to pursue future research among co-located educational entities.

Group 1: Classrooms: The objective of both colleges is to educate students. Therefore, classrooms in co-located colleges should focus on functionality (storage, flexibility, space and functionality), psychological well-being (views of nature and natural daylight) and physical well-being (temperature control, adjustable lighting to accommodate media presentations and good acoustics) to illicit positive perceptions from the student population. The preferences are listed in order of their importance according to the sample frequency distribution comparison analysis ranked by Environmental Preference using the Wilcoxon Sum Rank test.

- Adequate Storage in Classroom
- Outside View
- Classroom Temperature Controls
- Flexible Classrooms

- Natural Daylighting
- Adjustable Classroom Lighting
- Acoustics
- Adequate Space in Classroom
- Rooms that Function Properly.

Group 2: Segregation of Organizations: When this term was suggested in the pilot study, there were negative issues between the two co-located colleges in the Dallas study, but in actuality, desegregation is the appropriate term if the two colleges are to collaborate (employee and student co-mingling). That being said, certain activities and/or functions that must occur within departments, such as Admissions, the Arizona School of Clinical Psychology at Argosy University, accounting and Student Financial Planning, should remain segregated for privacy (privacy to complete job or counseling tasks), but require identification (signage and branding). Security (multiple security checkpoints) is a factor for both “segregation” and “desegregation,” as the students and employees must be protected from harm from external forces, such as the aforementioned bomb threat. Again, the preferences listed in this grouping are in order of their importance according to the sample frequency distribution comparison analysis ranked by Environmental Preference using the Wilcoxon Sum Rank test.

- Having Privacy to do My Work
- Co-mingling of Employees

- Appropriate Signage
- Logo/Brand Location
- Co-mingling of Students
- Segregating Classes by Organization
- Multiple Security Checkpoints.

Group 3: Environment: Site perception considerations include factors such as college/class/student promotion (displays, signage, branding, and aesthetics), physical well-being (temperature controls, security with multiple checkpoints, proximities between offices and classrooms, and appropriate acoustics), psychological well-being (views of nature and daylight, privacy to work, sufficient office space and storage, and functional spaces), and environmental sustainability (use of sustainable building materials). However, the environment alone cannot make a successful co-location, so collaboration activities that unite the students and/or employees are also important. As stated in the previous two groupings, the preferences listed below are in order of their importance according to the sample frequency distribution comparison analysis ranked by Environmental Preference using the Wilcoxon Sum Rank test.

- Student Work Display Area for Each Organization
- Outside Views
- Having Privacy to do My Work
- Classroom Temperature Controls

- Appropriate Signage
- Logo/Brand Location
- Natural Daylighting
- Adequate Office Space
- Adequate Office Storage
- Campus Security
- Campus Aesthetics
- Acoustics
- Rooms that Function Properly
- Office Located Near Classrooms
- Sustainable Building Materials
- Multiple Security Checkpoints.

As indicated in Table 15, some preference overlap is expected because preferences can apply to a variety of situations.

TABLE 15: Groups of Preferences

RANK	ENVIRONMENTAL PREFERENCE: SAMPLE	#1 CLASSROOMS	#2 SEGREGATION OF ORGANIZATIONS	#3 ENVIRONMENT
1	Student Work Display Area for Each Organization			3
2	Adequate Storage in Classroom	1		
3	Outside View	1		3
4	Having Privacy to do My Work		2	3
5	Co-mingling of Employees		2	
6	Classroom Temperature Controls	1		3
7	Appropriate Signage		2	3
8	Flexible Classrooms	1		
9	Logo/Brand Location		2	3
10	Co-mingling of Students		2	
11	Natural Daylighting	1		3
12	Adequate Office Space			3
13	Segregating Classes by Organization		2	
14	Adjustable Classroom Lighting	1		
15	Adequate Office Storage			3
16	Campus Security			3
17	Campus Aesthetics			3
18	Acoustics	1		3
19	Adequate Space in Classroom	1		
20	Rooms that Function Properly	1		3
21	Office Located Near Classrooms			3
22	Sustainable Building Materials			3
23	Multiple Security Checkpoints		2	3

Through the creation of these groups, “pattern” or design guides can be created, as is standard for design and construction of most types of structures or environments, such as guidelines issued for governmental buildings, urban streets and bikeways, college campuses, and libraries. Elaborating on

Alexander's philosophy, each group can be viewed as a problem to be resolved, and the preferences can be viewed as the patterns to assist in problem resolution. Alexander (1977) states that there should be movement "...always from the larger patterns to the smaller, always from the ones which create structures, to the ones which then embellish those structures, and then to those which embellish the embellishments." In other words, review the list of patterns (preferences) to determine those that are relevant, prioritizing from most important to least important until all patterns have been included. Sequencing can be adjusted as deemed necessary. For example, when considering Group 1: Classrooms, the following patterns (preferences) might be selected in this order, moving from larger issue to smaller issue:

Classrooms

Adequate Space

Flexible Classrooms

Rooms that Function Properly

Adequate Storage

Acoustics

Temperature Controls

Adjustable Lighting

Outside Views

Natural Daylighting

For example, a Classroom Pattern narrative might consist of the above ordered components:

"Classrooms provide an environment uniquely suited to specific learning objectives; a place where both students' and faculty needs must be accommodated. Identifying the type of setting most appropriate to the learning

objective(s) is the first priority (large lecture, small lecture, seminar, studio, or lab), and adequate space to meet the learning objectives the next priority. The classroom should accommodate a range of activities appropriate for the setting type – it should function as intended with ample storage, appropriate acoustics, and controllable temperature and lighting. Classrooms require views to the outdoors to allow occupants' eyes to focus at a distance providing some relief from near-focused activities within the classroom. Daylighting should supplement artificial lighting in the classrooms promoting a psychological connection to the exterior environment.”

Design guides using *Alexander's Pattern Language* (1977) format would allow those considering future co-location planning to avoid “recreating the wheel,” and permit the planners to focus on those environmental preferences that fit within their individual objectives for the creation of a co-located facility.

Study Limitations

A convenience sample, wherein respondents voluntarily completed the survey, was employed in its distribution to The Art Institute and Argosy University, primarily due to the ease of obtaining participants, time efficiency, and the low cost of dissemination and collection of data compared to other methods. While technically the results are empirically derived and statistically assessed, this sample's results are more aligned with those found in a case study than

those from a larger, more randomly sampled investigation. The lack of control over the representation of the various groups is a disadvantage of this type of sampling. Therefore, the results' generalizability to other populations is discouraged.

Despite this limitation, the investigation explored possible emerging response patterns between the two colleges and the research established links between environmental preferences and the roles they may play in determining potential co-location suitability/congruence.

The survey asked respondents to rank preferences identified in the pilot study without providing the opportunity to identify other preferences directly related to the Phoenix study. It may have been possible to generate respondent-based environmental preferences relevant to the Phoenix population, but no such effort was presented. Additionally, by surveying only the Phoenix campus, the results cannot be generalized to other populations of corporate co-located colleges.

Before the data collection phase of the project began, obtaining consent from other campus sites became problematic. One location denied access because of a concern that the OSAS portion of the survey might instill negative feelings on campus. Upon reflection, the explanation of this section could have been clarified with examples prior to presenting the survey for approval in order to increase understanding of the survey intent.

Implications

The research reported here not only confirms a highly congruent co-location between two organizations, it provides quantifiable measures (i.e., a taxonomy) of the degree of their congruence. Over time, successive co-location investigations based on these measurement instruments can help identify the 'tipping-point' for successful co-location.

The two colleges involved in this study are very different in many areas: one uses a quarter system, the other uses a semester system; one offers day classes exclusively, the other also offers night and weekend classes; one offers an applied arts curriculum, while the other focuses on traditional academics; one uses CARS, a higher education management software, while the other uses Campus Vue operations' computer systems. Co-location works in this case because both colleges have similar values, as identified in this study by the Organization System Assessment Scale (OSAS), and because the leadership of both colleges hold mutual respect for each other, and, therefore, practice professional courtesy; they consistently collaborate and communicate with each other. Both colleges' leaders also attempt to keep college-initiated activities from disrupting the other college.

While sustainable building products was an indicated preference of the participants in this study, co-location may also be considered a sustainable business practice due to facility sharing, and also the sharing of services and

resources. The Art Institute and Argosy University share IT, facility management and security personnel. The colleges share the student parking garage and the ground level parking for faculty. The Art Institute's mailroom supports mail distribution for faculty and staff, provides space for its supplies and marketing materials, and also provides a central location for incoming and outgoing bins for Argosy mail. Additionally, a shared library is staffed by The Art Institute's librarian during the daytime hours, while the Argosy librarian is primarily on site during evening and weekend hours. This allows students from either college to check out materials during all of the library's open hours.

In the future, it may be possible for the colleges to share adjunct faculty to teach courses that both offer, such as English, Psychology, Math and Business.

The de-duplication of the services mentioned allows these two colleges to save both money and resources in their efforts to be financially sound.

Co-location requires collaboration in order to be successful, as design requires the collaboration of architects, interior designers, engineers and contractors. "Collaboration implies a durable relationship and a strong commitment to a common goal" (Chiu, 2002) and requires communication to share ideas so that participants all have the same perceptions (Chiu, 2002).

Mutual respect and professional courtesy are important behaviors of those working and learning within a co-located environment. It is also a fact that the majority of Argosy University classrooms, offices and labs are on a separate floor

from those occupied by The Art Institute; this appears to be a beneficial factor in the success of these co-located colleges in terms of noise, different class times, and decor. Argosy and The Art Institute have different interior finishes, color schemes, office layouts and ambiances. Similar to roommates in a two-bedroom apartment, having 'your own space' allows colleges to maintain some privacy and some autonomy.

This research can also be applicable to other co-located scenarios such as the "...rapid and large number of 'corporate mergers' in recent years" (DSouza, 2015) wherein the individual companies have either combined their branding or retained their own identities. Examples of these include Disney and Pixar in 2006, Sirius and XM radio in 2008, Exxon and Mobil in 1999, Heinz and Kraft Foods in 2015, and Yahoo! and Associated Content in 2010.

In closing, this research shows that quantifying the critical environmental preferences and preferred organizational system types addresses two important co-location components.

First, it establishes a starting point for discussions between the organizations. If communication between co-located organizations is important, as this research suggests, then identifying and understanding the specific topics of agreement and disagreement facilitates an efficient dialogue between organizations. What is working well can be enhanced and focus can be placed on what does not work well.

Second, the measurement tools can be used as diagnostic instruments well beyond the co-location planning phase. Once co-located, the instruments could be administered to assess changes in environmental and/or organization system type preferences. The tools developed in this research have applications throughout the co-location arrangement. As diagnostic instruments, they can meaningfully contribute to co-location sustainability by preemptively identifying the critical junctures where organizations may begin preference divergence before the co-location situation deteriorates beyond repair.

Recommendations for Future Research

Additional research is warranted in more co-location sites to confirm the reliability of findings from the Phoenix study. A greater understanding of the processes involved in organizational co-location may also be achieved by studying colleges outside the Education Management Corporation (EDMC) family, and perhaps on an international scale, to contribute to theory development.

A more detailed assessment of potential interrelationships among environmental preferences would result from a study composed of randomly selected respondents and a sample of sufficient size to allow parametric statistical analyses. For example, large sample factor analysis of environmental preferences would make it possible to identify related factors – a statistical

refinement that would strengthen an already effective measurement instrument. In order to achieve such a sample, it is recommended that the organizations interested in a co-location diagnosis be pursued. If the organizations that benefit most from the assessment initiated the research, achieving a random sample would be easier to achieve than if the researcher approached organizations independently. Having access to a randomly selected sample of sufficient size would permit an array of parametric statistical procedures to be conducted -- specifically, correlation analysis, factor analysis and multiple regressions.

The convenience sampling procedure used in the dissertation research made inferential statistical analyses impossible. One type of analysis from a random sample would examine co-variance through an application of the Pearson product-moment correlation. Environmental preference items could be analyzed and a correlation matrix produced. From this matrix, the items correlated could be 'clustered' into like groups. This would be a first logical step in refining the Environmental Preference instrument.

A second, more robust attempt at instrument refinement would be to employ a factor analysis procedure. Factor analysis identifies the primary 'factors' underlying an array of survey items. The factors are weighted (factor scores) and their potential contribution to the understanding of the aggregate survey items is presented. Factor analysis, in this regard, is a bit more sophisticated than correlation analyses, in that the factor scores identify the 'weight' of a factor.

A slightly more complex statistical undertaking would examine two multiple regression models. First, using the Environmental Preference items as independent variables, each of the OSAS system types could serve as the dependent variable. This investigation would yield the causal relationship between the Environmental Preference items and the individual OSAS system types. In addition, the reverse procedure could be employed, wherein the OSAS system types could serve as the independent variables with each individual Environmental Preference item serving as a dependent variable. In this scenario, the goal would be to identify the weight of each OSAS system type in predicting individual Environmental Preference items.

The ongoing evolution of the Environmental Preference instrument should first focus on data reduction – reducing the number of survey items into a more manageable size. Understanding the inter-relationship of these items is crucial to going beyond correlation analysis. Once a clearer statistical picture of the underlying nature of the relationships emerges, an array of subsequent analyses could be conducted yielding better comprehension of the relationship between environmental and organizational system type preferences. The greater this understanding, the more useful these instruments become in organizational co-location studies.

Further, surveys could be modified for specific locations or to add individual preferences -- an aspect absent in the present survey.

Summary

The Phoenix study identified three tools for measuring potential co-location success:

- 1) a survey of environmental preferences;
- 2) Organization System Assessment Scale (OSAS) IDEAL type index patterns;
- 3) Percent Distribution Comparison within the OSAS IDEAL type index.

The co-location of the two corporate colleges that participated in the Phoenix study, The Art Institute and Argosy University, is considered successful based on these results:

- 1) The environmental preference yielded 96 percent congruency with a goal of 75 percent or greater threshold for congruency.
- 2) Between the two organizations, identical OSAS ideal type patterns were observed – Synchronous, Random, Closed, Open.
- 3) The Percent Distribution Comparison showed 95 percent congruence within the highest results with a goal of 75 percent or greater congruence.

An assortment of viable foci for future co-location research endeavors are possible, but not limited to the following: Does co-location actually enhance the fiscal bottom line, and if so, to what extent?; do compatible organizations actually

reduce environmental impacts and under what conditions?; what are the specific advantages attained in real estate as a result of co-location and what are the observed benefits?; to what degree are development and resource procurement affected by co-location?; and, how do co-location collaboration opportunities between organizations contribute to increased employee morale and employee retention? The field of co-location research is filled with fertile opportunities for meaningful future research.

APPENDIX A

Results of Pilot Study with The Art Institute of Dallas and Argosy University-Dallas

Preferences	1st choice			2nd choice			3rd choice			4th choice			5th choice			Total Value
	Individual N	Combined N	value @ 5 pts.	Individual N	Combined N	value @ 4 pts.	Individual N	Combined N	value @ 3 pts.	Individual N	Combined N	value @ 2 pts.	Individual N	Combined N	value @ 1 pt.	
Functional Space	AuD 15=0.2			AuD 5/5=1			AuD 3/5=0.6			AuD 15=0.2			AuD 15=0.2			8.75
	AiD 2/12=0.17	0.37	1.84	AiD 1/12=0.08	1.08	4.32	AiD 1/12=0.08	0.58	1.74	AiD 0/12=0	0.20	0.40	AiD 3/12=0.25	0.45	0.45	
Privacy	AuD 4/5=0.80			AuD 0/5=0			AuD 0/5=0			AuD 1/5=0.2			AuD 0/5=0			4.40
	AiD 0/12=0	0.80	4.00	AiD 0/12=0	0.00	0.00	AiD 0/12=0	0.00	0.00	AiD 0/12=0	0.20	0.40	AiD 0/12=0	0.00	0.00	
Adequate Space	AuD 0/5=0			AuD 3/5=0.60			3.04									
	AiD 2/12=0.17	0.17	0.85	AiD 2/12=0.17	0.17	0.68	AiD 3/12=0.25	0.25	0.75	AiD 1/12=0.08	0.08	0.16	AiD 0/12=0	0.60	0.60	
Logical Adjacencies	AuD 0/5=0			AuD 0/5=0			AuD 1/5=0.2			AuD 2/5=0.40			AuD 0/5=0			3.04
	AiD 1/12=0.08	0.08	0.40	AiD 3/12=0.25	0.25	1.00	AiD 0/12=0	0.20	0.60	AiD 1/12=0.08	0.48	0.96	AiD 1/12=0.08	0.08	0.08	
Workspace Aesthetics	AuD 0/5=0			AuD 0/5=0			2.15									
	AiD 1/12=0.08	0.08	0.40	AiD 2/12=0.17	0.17	0.68	AiD 1/12=0.08	0.08	0.24	AiD 3/12=0.25	0.25	0.50	AiD 4/12=0.33	0.33	0.33	
Secure Workplace	AuD 0/5=0			AuD 0/5=0			1.98									
	AiD 1/12=0.08	0.08	0.40	AiD 1/12=0.08	0.08	0.32	AiD 5/12=0.42	0.42	1.26	AiD 0/12=0	0.00	0.00	AiD 0/12=0	0.00	0.00	
Acoustics	AuD 0/5=0			AuD 0/5=0			AuD 1/5=0.2			AuD 1/5=0.2			AuD 1/5=0.2			1.20
	AiD 0/12=0	0.00	0.00	AiD 0/12=0	0.00	0.00	AiD 0/12=0	0.20	0.60	AiD 0/12=0	0.20	0.40	AiD 0/12=0	0.20	0.20	
Flexibility	AuD 0/5=0			AuD 0/5=0			1.02									
	AiD 0/12=0	0.00	0.00	AiD 0/12=0	0.00	0.00	AiD 2/12=0.17	0.17	0.51	AiD 2/12=0.17	0.17	0.34	AiD 2/12=0.17	0.17	0.17	
Sustainability	AuD 0/5=0			AuD 0/5=0			0.48									
	AiD 1/12=0.08	0.08	0.40	AiD 0/12=0	0.00	0.00	AiD 0/12=0	0.00	0.00	AiD 0/12=0	0.00	0.00	AiD 1/12=0.08	0.08	0.08	
Physical Separation of Entities	AuD 0/5=0			AuD 0/5=0			0.40									
	AiD 1/12=0.08	0.08	0.40	AiD 0/12=0	0.00	0.00	AiD 0/12=0	0.00	0.00	AiD 0/12=0	0.00	0.00	AiD 0/12=0	0.00	0.00	
Temperature Control	AuD 0/5=0			AuD 0/5=0			0.40									
	AiD 1/12=0.08	0.08	0.40	AiD 0/12=0	0.00	0.00	AiD 0/12=0	0.00	0.00	AiD 0/12=0	0.00	0.00	AiD 0/12=0	0.00	0.00	
Proper Display Areas	AuD 0/5=0			AuD 0/5=0			0.32									
	AiD 0/12=0	0.00	0.00	AiD 1/12=0.08	0.08	0.32	AiD 0/12=0	0.00	0.00	AiD 0/12=0	0.00	0.00	AiD 0/12=0	0.00	0.00	
Lighting	AuD 0/5=0			AuD 0/5=0			0.32									
	AiD 0/12=0	0.00	0.00	AiD 1/12=0.08	0.08	0.32	AiD 0/12=0	0.00	0.00	AiD 0/12=0	0.00	0.00	AiD 0/12=0	0.00	0.00	
Accessibility	AuD 0/5=0			AuD 0/5=0			0.32									
	AiD 0/12=0	0.00	0.00	AiD 1/12=0.08	0.08	0.32	AiD 0/12=0	0.00	0.00	AiD 0/12=0	0.00	0.00	AiD 0/12=0	0.00	0.00	
Team Players	AuD 0/5=0			AuD 0/5=0			0.16									
	AiD 0/12=0	0.00	0.00	AiD 0/12=0	0.00	0.00	AiD 0/12=0	0.00	0.00	AiD 1/12=0.08	0.08	0.16	AiD 0/12=0	0.00	0.00	
Explanation of Signage	AuD 0/5=0			AuD 0/5=0			0.16									
	AiD 0/12=0	0.00	0.00	AiD 0/12=0	0.00	0.00	AiD 0/12=0	0.00	0.00	AiD 1/12=0.08	0.08	0.16	AiD 0/12=0	0.00	0.00	

APPENDIX B

Slides from Dallas Pilot Study

Shared Spaces:

Argosy University-Dallas

&

The Art Institute of Dallas



Entrance from Sky Bridge to Parking Garage



4th Floor Elevators



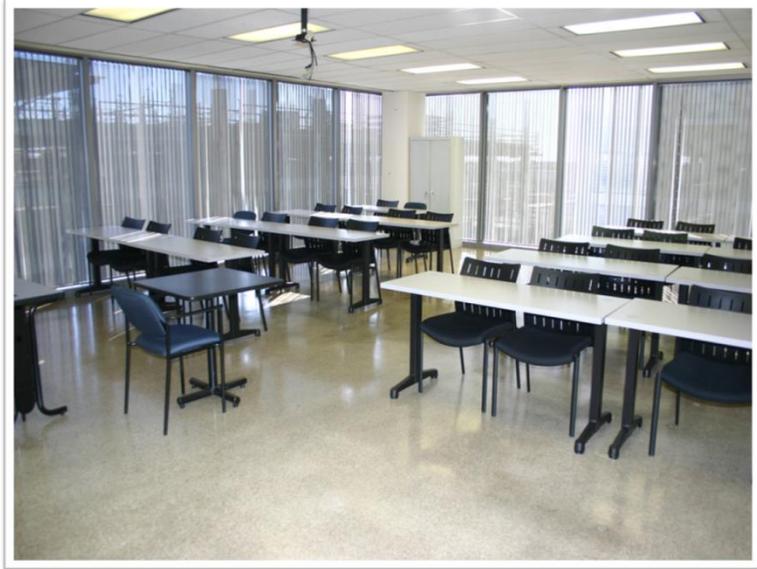
Argosy Corridor



Argosy Administrative Area



Argosy Make-shift Classroom



Argosy Classroom



The Art Institute Wall of Success



Drafting Lab at The Art Institute



Student Lounge



The Art Institute Administrative Area



3rd Floor Elevators Across from Parking Garage Sky Bridge

APPENDIX C

Environmental Preferences of Users in Co-located Colleges

DETERMINE IF PARTICIPANT IS VALID

1. Your Age? _____ years
2. Participants must be at least 18 years of age to answer this survey. If you answered less than 18 years of age, please click “next” to exit the survey.

CONSENT FORM

I have been asked to participate in a research study examining the influence of organizational systems perceptions on environmental preferences in co-located colleges. It is being conducted for doctoral research at the University of Missouri. I was asked to be a possible participant because I am either currently attending classes or working at Argosy University – Phoenix or The Art Institute of Phoenix in Phoenix, AZ. No minor children will be involved.

If I agree to be in this study, I will be asked to continue this survey and answer questions related to my perceptions and preferences. Completing the survey should take less than 10 minutes. There are no reasonably foreseeable risks or discomforts that might occur as a result of my participation and each participant has something valid to offer. If I complete this focus group and think I need support or feel emotional discomfort, several resources I may contact for help include The EDMC Employee Assistance Program (EAP): The Wellness Corporation, www.wellnessworklife.com, 800.828.6025

The benefit of participation that may be expected from the research is insight into the nature of the preferences of environmental factors in co-located work environments. By participating in this survey, I have the option to be entered into a drawing to win a \$100 gift card. One entry will be drawn from the student group of respondents from each school (total of two cards) and one entry will be drawn from the faculty and staff group of respondents from each school (total of two cards) to equal four gift cards.

This study is confidential, and all records will be kept private. The information that I provide will not be reported in any documents so that it can be connected back to me. My responses will be tallied independent of any code that would identify me as a participant. No works linking me to the study will be included in any sort of report that might be published. Research records will be stored securely, and only Jan Parker will have access to the records. I have the right to get a summary of the results of this research if I would like to have them.

I understand that my participation is strictly voluntary. My decision regarding my participation will not affect my current or future relations with Argosy University, The Art Institute of Phoenix or the University of Missouri. If I decide to participate, I am free to refuse to answer any of the questions that may make me uncomfortable. I can withdraw at any time without my relations with the university, job, benefits, etc., being affected. I can contact Jan Parker at 469.587.1243 or 214.354.5000 or parkerj@aui.edu or her advisor, Dr. Ronn Phillips at 573.882.4575 or phillipsr@missouri.edu.

I understand that this research study has been reviewed and Certified by the Institutional Review Board, Argosy University – Phoenix and the Institutional Review Board at the University of Missouri. For research-related problems or questions regarding participants' rights, I can contact the UM Campus Institutional Review Board Office at 573.882.9585 or Dr. Jared Chamberlain, chair of the Argosy University – Phoenix Institutional Review Board at 602.216.3177.

I have read and understand the explanation provided to me. I have had all my questions answered to my satisfaction, and I voluntarily agree to participate in this study. I understand that I may print this page as a copy of this form.

By clicking the box below, I consent to participate in this research study.

- I want to participate in this research study.
 I do not want to participate in this research study.

Principal Investigator:

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SURVEY INTRODUCTION & INSTRUCTIONS

Environmental Preferences in a Co-located School/Workplace

The primary goal is to identify the environmental/physical feature preferences in the design of a co-located school/workplace compared to the respondents' organizational worldview. The results will be used for doctoral research.

INSTRUCTIONS

In **SECTION I**, you are to check the response that best describes your level of agreement with the statement.

In **SECTION II**, you are to assign a value of 10 to only one answer for the (ACTUAL) condition that best describes your opinion. Then, assign a value from 0 to 9 to each of the remaining answers in the (ACTUAL) value list comparing it with the one you identified as best describing your opinion. Then repeat this procedure, but for the (IDEAL) condition this time.

SECTION III focuses on demographic items in order to gain a better understanding of the survey participant characteristics.

7. My office should be located near the classroom(s) in which I teach. (If not applicable, skip to Question 8.)

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
VERY STRONGLY DISAGREE	STRONGLY DISAGREE	DISAGREE	AGREE	STRONGLY AGREE	VERY STRONGLY AGREE

8. Campus aesthetics, such as beautiful furnishings, flooring, graphics, color schemes, etc., are highly important to me.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
VERY STRONGLY DISAGREE	STRONGLY DISAGREE	DISAGREE	AGREE	STRONGLY AGREE	VERY STRONGLY AGREE

9. Security is important to me.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
VERY STRONGLY DISAGREE	STRONGLY DISAGREE	DISAGREE	AGREE	STRONGLY AGREE	VERY STRONGLY AGREE

10. I think all classrooms should be sufficiently flexible to accommodate different types of classes.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
VERY STRONGLY DISAGREE	STRONGLY DISAGREE	DISAGREE	AGREE	STRONGLY AGREE	VERY STRONGLY AGREE

11. The use of sustainable building materials in the school is very important to me.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
VERY STRONGLY DISAGREE	STRONGLY DISAGREE	DISAGREE	AGREE	STRONGLY AGREE	VERY STRONGLY AGREE

12. Having good acoustics is important to me so that I can focus on my work/class.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
VERY STRONGLY DISAGREE	STRONGLY DISAGREE	DISAGREE	AGREE	STRONGLY AGREE	VERY STRONGLY AGREE

13. My classes should be physically separated from the other school's classes.

VERY STRONGLY DISAGREE STRONGLY DISAGREE DISAGREE AGREE STRONGLY AGREE VERY STRONGLY AGREE

14. I don't mind mingling with students from the other school.

VERY STRONGLY DISAGREE STRONGLY DISAGREE DISAGREE AGREE STRONGLY AGREE VERY STRONGLY AGREE

15. Each classroom should have options for controlling room temperature.

VERY STRONGLY DISAGREE STRONGLY DISAGREE DISAGREE AGREE STRONGLY AGREE VERY STRONGLY AGREE

16. Each major/program should have space for displaying student work.

VERY STRONGLY DISAGREE STRONGLY DISAGREE DISAGREE AGREE STRONGLY AGREE VERY STRONGLY AGREE

17. During the day, having natural daylighting in my classroom is important to me. (If not applicable, skip to Question 18.)

VERY STRONGLY DISAGREE STRONGLY DISAGREE DISAGREE AGREE STRONGLY AGREE VERY STRONGLY AGREE

18. I want a view to outside from my classrooms/office.

VERY STRONGLY DISAGREE STRONGLY DISAGREE DISAGREE AGREE STRONGLY AGREE VERY STRONGLY AGREE

19. Having appropriate signage throughout the building is important to me.

VERY STRONGLY DISAGREE **STRONGLY DISAGREE** **DISAGREE** **AGREE** **STRONGLY AGREE** **VERY STRONGLY AGREE**

20. Adjustable classroom lighting is important to me.

VERY STRONGLY DISAGREE **STRONGLY DISAGREE** **DISAGREE** **AGREE** **STRONGLY AGREE** **VERY STRONGLY AGREE**

21. It is important to me that my school's logo/brand is located in key areas so that visitors know where they are.

VERY STRONGLY DISAGREE **STRONGLY DISAGREE** **DISAGREE** **AGREE** **STRONGLY AGREE** **VERY STRONGLY AGREE**

22. It is important to me to have adequate space in my office. (If not applicable, skip to Question 23.)

VERY STRONGLY DISAGREE **STRONGLY DISAGREE** **DISAGREE** **AGREE** **STRONGLY AGREE** **VERY STRONGLY AGREE**

23. It is important to me to have adequate storage space in my office. (If not applicable, skip to Question 24.)

VERY STRONGLY DISAGREE **STRONGLY DISAGREE** **DISAGREE** **AGREE** **STRONGLY AGREE** **VERY STRONGLY AGREE**

24. It is important to me to have multiple security checkpoints throughout the building.

VERY STRONGLY DISAGREE **STRONGLY DISAGREE** **DISAGREE** **AGREE** **STRONGLY AGREE** **VERY STRONGLY AGREE**

SECTION II

For each of the questions below, assign a value of 10 to only one answer for the (ACTUAL) condition that best describes your opinion. Then, assign a value from 0 to 9 to each of the remaining answers in the (ACTUAL) value list comparing it with the one you identified as best describing your opinion. Then repeat this procedure, but for the (IDEAL) Condition this time.

ORGANIZATIONAL SYSTEM ASSESSMENT SCALE (OSAS)

25. What is the approach your organization most typically uses to achieve and accomplish what it wants (ACTUAL)? And, what approach would you prefer it uses to achieve and accomplish what it wants (IDEAL)?

	ACTUAL VALUE	IDEAL VALUE
(a) Unstated agreements and just knowing what to do		
(b) Authority, rules, and discipline		
(c) Personal freedom, individual competence, and choice		
(d) Cooperation, discussion, and mutual agreement		

26. In what manner does your organization express its caring and support for each other (ACTUAL)? And, how would you prefer that it expresses its caring and support for each other (IDEAL)?

	ACTUAL VALUE	IDEAL VALUE
(a) Expressive, responsive, and given willingly		
(b) Private, formal, and regulated		
(c) Spontaneous, public, and enthusiastic		
(d) Limited, reserved, and rarely expressed because we know we care deeply for each other		

27. How would you describe the “essence” or identity of your organization (ACTUAL)? And, how would you prefer the “essence” or identity to be described (IDEAL)?

	ACTUAL VALUE	IDEAL VALUE
(a) Impulsive, instinctive, and energetic		
(b) Traditional, stable, and consistent		
(c) Precise, exact, controlled, and harmonious		
(d) Practical, tolerant, and relevant		

28. As your organization experiences the objective events and situations in life, how does it seek to understand those events (ACTUAL)? And, how would you prefer that it seeks to understand those events (IDEAL)?

	ACTUAL VALUE	IDEAL VALUE
(a) By being flexible, questioning, and challenging		
(b) By relying on individual strengths, unique explanations, and by being explorative		
(c) By being methodical, conservative and by using time-tested explanations		
(d) By being knowing, certain, wise, and assured		

27. What is your organization’s most important characteristic (ACTUAL)? And, what would you prefer to be its most important characteristic (IDEAL)?

	ACTUAL VALUE	IDEAL VALUE
(a) Our understanding of the objective world around us		
(b) The identity of the organization, who we are and what we stand for		
(c) The care and support that we give to each other		
(d) That we accomplish, achieve, and do what we want		

SECTION III

The following questions are for demographic purposes.

28. Which of the following best describes your current status at school? (Check all that apply.)

- STUDENT STAFF FACULTY ADMINISTRATOR

29. If you are a student, which of the following best describes your current status?

- FRESHMAN (Quarters 1-3) SOPHOMORE (Quarters 4-6) JUNIOR (Quarters 7-9) SENIOR (Quarters 10-12) MASTER'S STUDENT (Argosy only) DOCTORAL STUDENT (Argosy only)

30. With which school are you affiliated?

- THE ART INSTITUTE OF PHOENIX ARGOSY UNIVERSITY - PHOENIX

31. My gender?

- MALE FEMALE

SECTION IV

Complete only if interested in participating in the drawing for a gift card.

28. Name

29. Email Address

Thank you for your participation!

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