University of Cincinnati

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I, Kelly M Hogg, hereby submit this original work as part of the requirements for the degree of Master of Architecture in Architecture (Master of).

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Unifying University Culture through a Simplified Functionalism

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Unifying University Culture through a Simplified Functionalism

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Unifying University Culture through a Simplified Functionalism

by Kelly Hogg
There are many universities around the world that have extensive materials research institutions. These universities seem to focus their attention and research mainly on the micro and nano scales while taking the approach of a chemist. This specific type of material research has helped the world develop many of the technologies enjoyed today. Whilst developing nanofibers used in electronics from silicon based synthetic compounds is helpful to the massive electronics world, there are other projects that need our attention.

Despite the growing number of institutions that have this type of material research facilities, including the University of Cincinnati, there is a need for a different type of research. This type of research is focused on advanced material innovations for buildings. The University of Cincinnati’s already proven Materials Research programs are a stepping stone to this new research venture; this type of research exists at only a few places around the United States.

The institute will develop and improve upon advanced materials in a way in which they can better building material products and processes. These products will not only benefit the physical building community, but will also benefit society through the use of these new materials in other products.

The advancement of these new materials will be controlled by a new department within the university, but will ultimately rely on the interdisciplinary efforts from many different departments. Some of these departments include Architecture, Industrial Design, Chemical & Materials Engineering, Civil and Environmental Engineering, Biology, Physics, and others.

By using multiple disciplines to create and develop new and innovative advanced materials, the institution will yield results unlike any other around the country. For the purpose of experimentation the institute will use its own building and university as a playground for its unique developments. This means that the progress and developments made within the Material Research Center will not only be tested inside the labs, but also used as either mock-ups or final installations on the building itself.

This institution is at the forefront of the design world; giving itself the opportunity to create new systems that will eventually be mainstream. In The handbook of Advanced Materials: Enabling New Designs, James Wessel states, “Psychologists tell us that 5% of designers are willing to try something new and 80% will follow if the 5% are successful”. This statement is the precise principle in which the new Materials Research Institute should and will operate.
The new facility for the research center in itself has to be revolutionary in both its design and concept to show the community that it will do precisely what its meant to do. This concept and system will also exhibit the qualities of University Culture to promote its function within.

The goal of this document is to coordinate the relationships between a university, functionalism in the 21st century, and advanced materials for the development of a Materials Research Institute while also giving a detailed account of each.
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This thesis project can be attributed to multiple facets of life, without which I would have never had the energy, drive, or commitment to pursue such an endeavor.

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Vincent Sansalone as the Primary thesis chair who guided me through the obstacles of defining a thesis and pushed me to create an even greater design.

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Without these people and the activities outlined above, I cannot be certain I would be in the same place today.
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Figure (1) - expression of culture in building design

Figure (2) - expression of culture in building design
Introduction

There are many universities around the world that have extensive materials research institutions. These universities seem to focus their attention and research mainly on the micro and nano scales while taking the approach of a chemist. This specific type of material research has helped the world develop many of the technologies enjoyed today. Whilst developing nano-fibers used in electronics from silicon based synthetic compounds is helpful to the massive electronics world, there are other projects that need our attention.

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The new facility for the research center in itself has to be revolutionary in both its design and concept to show the community that it will do precisely what its meant to do. This concept and system will also exhibit the qualities of University Culture to promote its function
Figure (3) - mixing cultures within the University built environment
within.

The goal of this document is to coordinate the relationships between a university, functionalism in the 21st century, and advanced materials for the development of a Materials Research Institute while also giving a detailed account of each.
Figure (4) - misconception about culture as ethnical. [Cincinnati underground railroad freedom center]

Figure (5) - expression of cultural connections as a similar phenomenon to the human anatomy
The first thing that comes to mind when thinking about a cultural institution is ethnicity; in Cincinnati, it is the Underground Railroad Freedom Center. Culture is more than just ethnicity. It exists anywhere and everywhere. Best defined by Edward Burnett Tylor in 1874. “Culture or civilization, taken in its wide ethnographic sense, is that complex whole which includes knowledge, belief, art, morals, law, custom, and any other capabilities and habits acquired by man as a member of society.” This idea encompasses every group of people on earth, whether it is the ancient Egyptians or the science club at the University of Cincinnati. This chapter will take a look at the complexities of university culture and how it relates to multiculturalism. University culture can be broken down into many subsets, these include organizational culture, ethnical culture, student culture, faculty culture, and departmental culture. Not only is culture everywhere, but multiculturalism is a part of everything, similar to the human anatomy in the sense that everything is a part of a bigger whole. Within university culture, departmental culture exists as a separation from the outside world. These cultures don’t always communicate well with each other; this is a big problem that universities face.

A misconception in today’s society is that ethnicity culture is the only culture. The spectrum of culture is vast; it is said to have 164 different definitions. When people talk about ethnicity culture, they are usually talking about human origins and race. Although one might associate this as a downfall in the human thought process, ethnicity culture is very important to our society. The culture of ethnicity is everywhere in the world and is ever-so-different from country-to-country and town-to-town. Without cultural ethnicity, the United States wouldn’t be known as the “Melting Pot”, but rather, a collection of people from around the world who are all the same. Although different, ethnicity culture plays a key role in Multiculturalism and university culture. Multiculturalism as it pertains to university culture is one of the most important aspect of this chapter.

University culture is one unlike any other. It seems to always be in conflict with itself in one way or another. Universities have a complex system of cultures that many associate themselves with. Most likely these people associate themselves with more than one university culture simultaneously. With this in mind, subcultures within the university may have conflicting goals and values. In Corporate Culture and Organizational Effectiveness Denison states that “Weak cultures are characterized by relatively loosely linked subunits or groups with specific cultures that can be contradictory to each other. They are called subcultures. Depending on the degree of linkage between the subcultures, universities have more or less problems to develop a unified strategy for the institution.

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1 Tylor, E.B. 1874. *Primitive culture: researches into the development of mythology, philosophy, religion, art, and custom.*

Figure (6) - example of cooks doing repetitive tasks day after day

Figure (7) - chef presenting advancements made in his profession

Figure (8) - professional culture
that can be put into action quickly. Depending on the environmental situation universities are facing, strong or weak cultures can be more effective.” Denison’s thoughts toward university culture are true for universities around the world. Subcultures are vital to their success, but also set them up for failure as an institution. This chapter will discuss the volatilities in university culture and how they can be strengthened through multiculturalism and forced academic cultural interaction.

1.1 Professional Culture

Before you can understand the struggles of university culture, it is important to understand a little about the opposition; Professional Culture. Professional culture exists everywhere in today’s society. It exists as the culture in which a profession embodies. Professions can be found in a variety of organizations. These can be professional organizations made up predominantly of one profession; large organizations employing a variety of professional groups; organizations comprising several different professionals working in multi-disciplinary teams; or organizations consisting largely of non-professional staff but employing a few professionals in specialist roles. The professionals within these organizations are the basis for professional culture. Professional culture is loosely based around the idea of professionalization, or the method that an occupation uses to gain its status as a profession; which is usually a process that includes simultaneous events. All of these events are centered around the goal of professionalization and include such activities as developing standards and codes of ethics, developing a political base for public support and knowledge, forming professional associations, and the process of gaining control over their particular area of work to set it apart from other similar professions.

Professionalization is not a simple process, but rather, comprises a complex and dynamic series of processes involving many players at different levels over a long period of time. This being said, there are professions for everything in the world today, all of which contain a very specialized culture that is in ways similar but different than the next. Professionals maintain a high code of ethics when it comes to what they do, giving them credibility among the community. They are also continuously striving to better their culture and profession. For example, a cook can be a professional or a non-professional. In most cases a professional cook is referred to as a chef, which most understand as a more respectable profession than a cook. More than not, a cook spends their day in the kitchen cooking the same things every day whereas the chef looks to better the menu that already exists. This type of process is what makes them and anyone else a professional.
Figure (9) & (10) - fine art club and scuba club within university culture

Figure (11) - university as a melting pot for people to research and study
1.2 University Culture

“Universities are complex organizations with a unique set of features. Unlike many profit-making organizations, universities have certain characteristics that need to be understood and that dominate the culture of academic institutions.”

University culture is similar to professional culture in that it provides opportunities for advancement of a specific field, similarly to a given profession. Although this similarity exists, university culture has more complexities and in-turn makes it weak in comparison to professional culture. University culture exists in practically everything that goes on at a university.

It is made up of not only many separate smaller cultures, but overlapping sub-cultures. Together these cultures are complex organizations with little formalized structure and weak control mechanisms, university culture as a regulator needs special attention. Apart they become more stable and more reliable. “A university with very strong subcultures can - once realized - be developed into a more unified institution by initiatives that trigger a higher degree of identification.”

As universities confront the challenges of mass education or financial decline, the understanding and management of university culture can become vital. Because many universities are a conglomerate of autonomous subunits with loose links and a high degree of specialization in the disciplines, overall integration at a broader level is needed.

One of the main sub-cultures is student culture. As a student at a university, you belong to the student body. Student culture exists as a form of generalization of students; it pertains to relationships in which the students hold among themselves at the university. The best example of student culture are student organizations; these are made up of students, for students. Organizations such as these are each a culture in and of themselves. Similar to student culture is faculty culture; faculty makes up a large percentage of the university. It is normally organized into smaller cultures based on beliefs and research.

Another university sub-culture is related to the previous topic of ethnicity culture. Students and faculty alike provide the university with many distinct ethnical cultures. As the United States is a melting pot for people to immigrate, universities are melting pots for people to study. For example, the University of Houston is one of the more culturally diverse universities in the United States; it draws people from a collection of nationalities around the world. Groups such as these can be very similar to each other or very unique.

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4 Birnbaum 1988; Baldridge et al. 1977. Page 2
7 Becher 1981; Clark 1983; Dill & Sporn 1995b; Clark 1995
Figure (12) - integration of students into the professional environment to work together

Figure (13) & (14) - Misconceptions about student culture within university setting & actual student culture
Finally, departmental culture is one of the least thought about but most important cultures within the university. Departmental culture refers to the culture which exists within each department or college at the university. These sub-cultures are not always perceived as cultures, but they truly are those that can best represent a university. Culture that exists in this way is the backbone of a universities’ academics. They provide the students and faculty a range of information to research and study, providing each of them with specific specialized knowledge. This knowledge is the key to “High Culture“.

High culture within the university or research institution is the very essence of its existence. To strive for high culture is the purpose of a college education; it is the path to innovation; it is the advancement of society.

Not only does each department across a university strive for “High Culture”, they aspire to innovate. These innovations exist within the department but are not always communicated to the greater university culture. This is where multiculturalism needs to play a bigger role in the university as a whole.

The perception of the university from the community and the general public do not always represent what the university would like. More often than not, the community looks at the student culture as an evaluation. This is because they have direct interaction with the students; and its not always in a positive way. For example, when someone mentions Miami University in Oxford, Ohio, most often, the first reaction is about the people. Miami University students are alleged as conceited; this is not necessarily the image that the university itself wants to portray.

In order to show the community, whether regional or national, the true educational image, the university must find a unique way to set apart departmental culture from student culture. Some departments within universities have struggled to become well known just among the community whereas others are known by many across the nation. For example, most know of the Harvard University Business and Law Schools, but don’t necessary know that their linguistics department is the oldest and most distinguished linguistics school in the country[^9]. This can be said about most schools across the country; providing evidence that a lack of overall university culture exists. Which inevitably brings us to the question that this chapter is focusing on. What can be done to facilitate multiculturalism within a university setting?

This question addresses both the overall university culture as well as the departmental cultures and their relationships with community perception. More than just a link to the surrounding community, an institution for material culture should exist to promote the university as a whole. The rest of this chapter will look at the specific cultures discussed

Figure (15) & (16) - apposing organizations within university culture (science club & religious organizations)

Figure (17) & (18) - cultures that wouldn’t necessarily work together that could potentially have uses for one another
previously while always looking at the question at hand.

1.2.1 Student Culture

Different constituencies see students in many different ways. For example, most of the neighboring communities might categorize students broadly as if they are just a part of the bigger student body, while a coach thinks of the students as a part of a smaller team. Either way, the students are simultaneously in multiple student cultures.

Although many student cultures do coincide with each other in a harmonious fashion, there are many cultural examples within the student environment that do not work nearly as well. One of the best examples of such cultures exists in both student organizations and departmental cultures. The science based organizations and departments do not necessarily agree with the same morals as some of the religious organizations and programs around a campus. At the end of the day, these two student cultures are both part of the greater university culture.

Besides the aforementioned extreme case where student cultures don’t work together, there are many students in organizations that would not ever consider joining or teaming up with some of the other organizations from around the university. This type of non-interaction is the basis in which cultural diversity among students needs to overcome. Previous research shows that universities are organizations that are dominated by social interaction and therefore develop a very specific kind of organizational culture. With collaboration between student groups that wouldn’t normally associate themselves with each other, student culture will grow. Growth from this interaction is what helps students to become more innovative and pursue difficult goals. Interaction in this manner is the key to this document. The students that make up the culture at a university are also the ones that will eventually be the driving force in professional culture.

Universities are to a large extent ‘people-oriented’ institutions. Different constituencies need to be recognized for universities to fulfill their task. Among them are pre-work students who enter the institution with specific expectations and needs regarding their education and preparation for future professions. Others are executives looking for additional training or companies with problems they want to be closely researched. Therefore, agendas like the administration of regular programs, commissioned research, part-time continuing professional education or partnership and exchange programs with other academic and non-academic institution add to the cultural diversity and the challenge for university management.

\[10\] Becher 1981; Clark 1983. Page 5
\[11\] Barbara Sporn. Managing university culture: an analysis of the relationship between institutional culture and management approaches
Figure (19) - faculty aligning themselves with student culture for their own goals
Faculty culture is not unlike student culture; it has many different individual cultures that can be loosely tied to the student cultures at a university. Both professors and assistant professors have a stake in student organizations. They align themselves with a group of students that have similar interests academically as themselves. Like student cultures, the values and beliefs of these subcultures differ significantly. Professors try to establish a reputation in the scientific and business communities. Assistant professors have different attitudes and beliefs depending on their career ambitions. Therefore, their values are heterogeneous and their involvement in the management of the university is low. This process helps to grow their resume and/or provide evidence for their attempts at becoming tenured but doesn’t necessarily bode well for the university as a whole.

The subcultures of professors and assistant professors have divergent values and beliefs depending on their ambitions. All of them show an external focus only in different directions either more towards business or towards other academic institutions or colleagues. This culture that exists focuses on self-fulfillment more than the advancement of the university as a whole. Without the faculty at the university on-board, this cultural relationship between them and the university will never grow.

There are currently no general guidelines on how to manage teaching and research. Universities that understand this faculty structure can ultimately make the best of the situation. With the help of the individual departments, they can require professors and assistant professors to work to improve the university’s culture as a whole. This is the first step in creating a multicultural collaborative research institution. Without the faculty striving to better the university, plans for such an institute would be futile. After the professors and assistant professors are convinced that this process is essential to the growth of the community, the university departments need to follow.

Departmental culture exists in many different forms. It exists in both departments that have curricula and ones that don’t. It covers a broad range from colleges to specific majors. It even resides in the administration departments.

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Figure (20) - departmental administration meeting that won't result in any advancements in collaboration
When looking at departmental culture at a university, it is best to look first at the administration of each department. This is the group of people that make the final decisions on behalf of the entire department. If these cultures exist with professors that are narrow minded, the administration isn’t going to take it upon itself to shift its ideology. It gets to the point where the concept of the university as a whole barely exists and has no meaning for the university members.15

There are some departments that interact more than others. This shows that disciplinary ties exist that hold certain groups together but other departments are very “individualistic” in their communication behavior.16 It is not that all departments need to work together to create a better university culture, but each department needs to at least work with a few others.

“A uniform behavior of the institution as a whole is not a prerequisite for adaptation. Actually, the university’s capacity to innovate and adapt was built upon the formal network of disciplines and professions, as well as the informal network of academic work”17

With this mind-set, and with the faculty and student cultures working together, the universities culture should begin to grow, giving life to new institutions and departments. Universities will now have a hybridized departmental culture that globally supports innovative research initiatives. These initiatives may be big or small, they may need their own facility or may be housed within the existing infrastructure. Regardless, they promote the university in a different way, showing the community what the really do.

1.2.4 Internally vs Externally Focused

The orientation of universities around the world are both internal focused and externally focused; some are even universities that have a completely balanced approach between internal and external. Orientation refers to the focus of the values, attitudes, beliefs, and patterns of behavior of university members. The underlying assumption is that externally focused cultures support the adaptive strategies of management better than internally focused cultures.18 This assumption can be a blurred line when it comes to university cultures.

As stated before, university cultures are much different than professional cultures and others. They need to employ tactics of both internally focused and externally focused cultures if they want to excel as an institution. Each have their strong points and a balance should and needs to be realized.

Figure (21) - internally focused departmental meeting within the university

Figure (22) - departmental culture in an external capacity
Internally focused cultures concentrate on the internal dynamics of the organization. This can mean that the involvement of university members and their tasks in bureaucratic processes as well as the consistency between strategic and structural issues have priority over external challenges. With an internally focused mind-set, the faculty and students can achieve more without worrying about the outside complications. This process is good for the overall development of a program academically but doesn’t fulfill all of its needs while also leaving the university relatively weak.

Weak, internally-focused cultures have divergent values, beliefs, and attitudes. They are dominated by subcultures with their work being concentrated on internal affairs. The university members concentrate on their own work and do not identify with the university as a whole. Few members of the university community are willing to adapt the university to changing conditions in the environment.

“Externally focused cultures put more emphasis on the external development of the organization. In this respect, adaptability and mission statements are of major concern. Adaptation refers to the process of responding to some discontinuity ‘or lack of fit that arises between the organization and its environment’. A mission represents a shared definition of the function and purpose of an organization and its members. In a changing environment, an externally focused culture can fulfill these tasks more easily. This process shows the external community what the university is about and what they can do.

Weak cultures with an external orientation also have subcultures with divergent values and beliefs, but the subcultures are focused on the external environment. However, the activities of the different subcultures are not coordinated. With this orientation, the university can still adapt in a changing environment. To stay successful though, a strong university culture will have to be developed while the external orientation is retained.

1.3 Conclusion

Universities are vulnerable to their environment. Changes in political, economic, social, and technological conditions can effect the situation of universities strongly and should be used for strategic activity planning in higher education. It is evident in many countries of the Western world that universities are struggling with new forms of institutions that match institutional autonomy, social demands, and governmental regulations. Technical innovations can change patterns and processes

21 Cameron 1984
Figure (23) - University of Cincinnati: MCMicken Hall
of communication and the way universities interact with their environment dramatically\textsuperscript{23}. These technical innovations are the key to success as a university as a whole and should be used wisely to portray its image in sufficient light; if not, it could be construed against the university in a way that may effect its image negatively.

The responsibility as an institution for education and research is taken seriously by refined curricula, exchange programs with universities world-wide, or research projects with companies. Only the standards for a collective reaction to the external changes are missing. The subcultures concentrate on their own activities and the development of a specific image. That way, it is impossible to establish a strategy for the whole university to deal with its environment.\textsuperscript{24} As a way of making a point to the masses, the community, region, country, and even world, this idea needs rectifying. The only way in which a university might be able to bring all of its cultures together so that it may exist as a utopian culture could be the creation on new hybridized cultures that specifically cater to the external environment while also providing valuable research for its internal needs.

This idea is not purely architectural, but it exists within a number of realms; it could be solved by any number of ideologies. For the purpose of this architectural thesis, it will be explored through architectural thinking and processes. This involves looking at everything from style to connections to construction techniques and will be discussed in the following chapters.
Figure (24) - Neolithic style architecture

Figure (25) - le corbusier’s law of repolin in modernism
Chapter 2: Architectural Style

As mentioned in the introduction and further expounded in the previous chapter on culture, this chapter focuses on the architectural style that is encompassed within the thesis ideology as well as project. Using university culture as a springboard, this chapter looks to expound upon the idea of unifying the individual subcultures within the university through the use of architecture and its styles. The main styles within this exploration are Modernism and Functionalism with the idea of creating a new sub-style that interacts in a better way with the needs of the university.

I have took it upon myself to give this hybridization of styles the title of interactive functionalism; basically a modified simplification of functionalism mixed with new-age ideas and technologies. This is inherently not an architectural style but an adaptation of multiple styles and ways of thinking to create a new style; if only for a single project or type of project.

Architectural style dates back past 10,000 BC when the Neolithic style was at the forefront of the architectural society. The people of this time used what they had and what they knew to construct their houses and villages out of stone and mud brick; this is the beginning of what is known as the building industry. Out of the Neolithic Architecture came many new types of construction (architecture). Over the last twelve-thousand years, new architectural styles have been created exponentially. In the past 100 years there have been more than 35 new styles of architecture introduced.

These new styles include the styles that will be discussed in this chapter; Functionalism, Modernism, and Interactive Functionalism. Functionalism was developed in the early 1900s and is most famous for Louis Sullivan’s quote, “Form Follows Function”. This thought process is inherently that of a modernist architect in many ways. If the form of a building is based loosely on the function of the building itself, it should ultimately exist as a simplified non-ornate structure. Le Corbusier made his mark with this style of architecture. He refers to the clean lines and white paint that modernism exhibits as the Law of Ripolin.

The Law of Ripolin is an idea that Le Corbusier thought of as the method in which modernist architecture exists. It is the idea of modernity and the role it plays in the architectural presence of a building; it is the whitewashed walls of the houses in which Le Corbusier himself designed.

“These whitewashed walls are a signifier of people who have preserved intact the balanced structure of a harmonious culture.”1 In Towards a New Architecture, Le Corbusier’s Second Reminder to Architects regards Surface, where he advocates the achievement of simple forms through the clear articulation of the surface of architectural structures. He advocates their use toward achieving the sublime, not by following, rather, furthering the example of the engineer whose designs tend not toward architectural needs, but

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1 Le Corbusier, The Decorative Arts of Today, p. 189.
Figure (26) & (27) - modernism and the process in which a simplified functionalism operates
fulfill requisite structural and material needs and little more. The job of the architect is to understand these requirements and proceed toward the goal, utilizing geometry, generating lines and proportionality as its determinants. This notion is essentially the basis for using functionalism as a platform for university design. The idea that the structure and material itself are driving forces within the design of a piece of architecture. An architects instrument for design is enumerated by many factors. These factors can be attributed towards the client and their needs. Without this fundamental law within Modernity and Functionalism, where these forces may be ignored all together, the clients goals may be effected dramatically.

Since functionalism and modernism began, there have been many advancements in architectural styles as well as many styles formed in opposition. Despite the fact that functionalist thinking might be one of the best approaches to developing a building that works, its flaws still exist. Functionalism in architecture is thought of as a way in which the programmatic layout of spaces exists as the exterior building design, whereas a new look at functionalism in its simplest form could show a different meaning. This alternate vision for functionalism rather is a buildings design that responds to the programs functions instead of layout.

2.1 Modernism

“The term “Modern” has been used to describe various twentieth-century movements that combine functionalism with aesthetic ideals that reject historical precepts and styles.” Modernism itself began in the 1880s as the industrial revolution was changing the way we thought of just about everything. During the modernist architectural period there have been more than thirty different sub-styles. Modernism and its sub-styles are loosely based around the idea of form and necessity; this is a loose description because Modernism is defined differently by many.

Scholars and professionals studying twentieth-century buildings vary widely on their definitions of what the term “Modern architecture” entails and exactly what time period it encompasses. Generally, architects of the era and present-day architectural historians have avoided defining Modernism by any strict set of architectural characteristics because of the extensive range of materials and characteristics found in buildings of the recent past. This notion is similar to that of the idea and/or word “culture”. As explained in the first chapter it is misconceived by most who are not familiar with its intricacies. When unfamiliar persons speak of Modernism or Modern Architecture, they are really referring...
Figure (28) - Modernist ideals represented in the HUD building in the district of Columbia
to contemporary design; this can be attributed to the definition of the word “modern” in our society today as “involving recent techniques, methods, or ideas: up-to-date”\(^5\) or as “of, relating to, or characteristic of the present or immediate past: contemporary”\(^6\). These very definitions inherently show why people make this mistake.

Among many things that modernism is said to do, it looks at architecture in a simplified manner. It wants a building to be simple in both plan and elevation. It wants there to be an expression of simple craftsmanship without unneeded details and ornamentation. It wants to show the truth to the materials in which the architecture uses. Modernist architecture emphasizes function. It attempts to provide for specific needs rather than imitate nature.

### 2.2 Functionalism

Because of the nature of architectural developments at the beginning of the twentieth century and the terms used to describe those developments, the word “function” can hardly be used in connection with architecture without our minds’ leaping quite automatically to the word “functionalism”\(^7\). Before looking at Architectural Functionalism, it is good to state that it exists as a separation from the philosophical ideology of Functionalism in which it is stated as “a theoretical level between the physical implementation and behavioral output”\(^8\).

Functionalism in Architecture is a by-product of the original thinking within Modern Architecture, although the early roots of such thinking date back to the classical antiquity.\(^9\) This ideology was always changing over time. For example, before the twentieth-century, aesthetics played a role in the idea of functionalism, whereas after the beginning of the twentieth-century, aesthetics were placed by the way-side; this made the function of a building the end game rather than a means to the end when it came to design\(^10\).

Functionalism, both before and after the beginning of the twentieth-century, had a very specific logic in place; it was to always respect the hierarchy of the system of values that were inherently built within functionalism. This system would ensure that the architectural design of the building was focused on the precise systems as needed. These system include: the organic nature of design, the mechanical nature, and the moral nature. Organic meaning the process in which nature determines form; mechanical meaning the relationship a building has to the idea of a machine [and its efficiency]; and moral having the closest meaning as to what this thesis is trying to discover.

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\(^{5}\) http://www.m-w.com

\(^{6}\) http://www.m-w.com

\(^{7}\) The Concept of Function in Twentieth-Century Architectural Criticism. Page 7


\(^{9}\) LOOK AT END OF CHAPTER FOR #1

\(^{10}\) The Concept of Function in Twentieth-Century Architectural Criticism. Page 8
Figure (29) - Robert Venturi’s explanation of the billboard [Long Island Duck]

Figure (30) & (31) - Frank Gehry’s Guggenheim in Bilbao & Frank Lloyd Wright’s Guggenheim in New York City
Morality in architecture [and functionalism] is a process in which the building design should be honest with the form it has taken. In other words, a building should be the product of itself and the exterior should not lie about what it is and does. This vision of morality in itself is a strong enough idea to capture a style of architecture to itself.

2.3 Interactive Functionalism

John Habraken, theoretician and former head of architecture at MIT, suggested at the 2007 conference Global Place: Practice, Politics, and the Polis that “Modernism was in essence an age of transition. Architecture needs to be well informed and restless, offering advanced personal environments.” Even the venerable Frei Otto expresses concern for the current architectural climate, writing, “Today’s architecture is at a turning point. The big trends of the last decade are outlived and only a few buildings in the world manifest architectural perfection while paving new ways into the future.”

Architects are teetering on this tipping point. The current architectural model is unduly weighed down by centuries of out-dated working methodologies and singular prototype creation. Fundamentally this type of vision is similar to the origins of functionalism but with a different [simplified] look at the function. The buildings form is no longer forced to be directly related to the best program adjacencies and rather to the idea that the building embodies. Forms that follow this prescription will showcase their function to the outside environment, providing a billboard for the world to see.

Arguably, this simplified sub-style has already been used by many architects over time without pointing out the specific tie to functionalism. Concepts such as Venturi’s Duck and Gehry’s Guggenheim strive to display this type of interior function on the outside of their buildings. In Learning for Las Vegas, Venturi discusses this phenomenon as symbolism rather than functionalism. While explaining the idea of the Long Island Duck, he expresses the building merely as a billboard for the building as a shed, and that it may be able to contain anything as long as the billboard was recognizable. This duck as a billboard was more than that; it was a building that’s function was directly related to the exterior nature of the buildings design. In the minds-eye, this could be the same notion as the simplified functionalism tries to explain. The only inherent flaw is the remains of the building after the life of such a company; at this point yes, the building may become devoid of any initial design intention and should either be looked at as symbolism or not exist anymore.

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11 Celento. Page 7
12 Celento. Page 7
Figure (32) - separating architecture style from the norm
2.4 Conclusion

The use of this adapted architectural style lends itself to a program that is out of the ordinary; a program that excels by showing its true nature. A building that wants to be known by the community for what it is and what it does.

As many [famous] architects design and develop many new buildings, they don’t always use the explicit nature of the program in their designs. The programmatic interior may conform to the building typology, but it isn’t always easy to know what the building is at first glance. In functionalism, a good example of such ideology is Frank Lloyd Wright’s Guggenheim museum in New York City. The exterior of the building is directly related to the interior layout of space while the main aspect of the design is a continuous ramp in which to display art in one continuum. Although this building is very functional in nature, the exterior of the building doesn’t necessarily represent art in itself.

One of the main focuses of this thesis is to provide a way in which an Architectural style can provide a avenue that a university lacking an equal internal and external culture can use to create balanced multiculturalism. That is, a way that a university can express itself and the true nature of what they do and stand for. With this in mind, the university should look at building a new facility that encompasses that entire idea.

Depending on the goals of the university, there might be multiple institutional ideas as to what building typology should be considered to represent the university as a whole; not to mention other factors within the university such as funding and programmatic needs. For example, a university centered purely around the arts might consider a museum, gallery, or studio as a needed facility to successfully portray the university for what it is; for a research university, this idea is a little different. A university that calls itself research oriented is looking to get more than just an auxiliary building, it is looking to achieve the multicultural ideas discussed in the first chapter through a building that provides research innovation. Since at this point in the process these ideologies can apply to any university setting, the next chapter will discuss very specific ideas for a single selected university; The University of Cincinnati.
Die beiden neuen Bauten schließen den Blockrand.
The two new buildings close off the perimeter of the block.

Die Fassade zur Rue des Suisses leitet mit einem Knick nach innen.
The bend in the façade on Rue des Suisses guides one in.

Die unterschiedlichen Positionen der Blenden beleben die Fassade.
The various positions of the blinds enliven the façade.

Die Klappblenden aus Lochblech schaffen wie ein Vorhang Privatheit.
The perforated folding blinds function like a curtain to provide privacy.

Hinter den beiden Blockbauten erstrahlt sich ein langes Hofgebäude.
A long courtyard building extends behind the two new buildings.

Die Hoffassade des schmäleren Blockbaus an der Rue Jonquay.
The courtyard façade of the narrow building facing Rue Jonquay.

Kleine Betonbauten greifen den Maßstab der alten Hofbebauung auf.
Small concrete buildings adopt the scale of the former courtyard building.

Der Hof wird zum Garten; Drahtbespannung der Fassade für Kletterpflanzen.
The courtyard becomes a garden; the façade has wires for climbing plants.

Figure (33) - suggestive building types
Chapter 3: Building Type

As discussed in the previous chapter on Architectural style, there are multiple ways in which to address the need for a new facility that promotes the university culture as a whole. The most important part of the process is to make sure that the prescriptive methods in the first two chapters are acknowledged when deciding on a building type as well as the underlying institutional goals; that includes first university culture then architectural style.

University culture plays a key role in deciding what type of building will best represent the university as well as benefit its already existent culture. More that any other factor, this is the driving force that should be considered. The argument and position in this document is that university, especially ones lacking a cohesive external culture, need to find a way to achieve multiculturalism through internally focused and externally focused cultures simultaneously.

When thinking of a situation in which this hybridized architectural style could exist and benefit the underlying culture, the first thing that comes to mind is innovation. Buildings that sole purpose is to provide innovation to the community itself are at the forefront of buildings that would want to be known for what they encompass. If research is the underlying institutional goal, like The University of Cincinnati, these and other buildings with scientific intentions would benefit from styles that show off their research in some way.

A hybrid style of architecture will enable a building based around the idea of research to exhibit itself in many different ways. At The University of Cincinnati, the building wants to be research oriented as well as innovation oriented. The culture within this specific university is heavily weighted on the practical physical trades of engineering, construction, and design as they are some of the top rated programs. For the purpose of demonstration and examples aligning to these ideas, The University of Cincinnati would culturally benefit most from building type that can relate to these main fields systematically. A building type that would achieve this and bring these cultures together would be a research institution for the advancement of new building materials.

While this is not the only building that could represent the universities culture, it is one that most can appreciate. The building will be designed to both show the inherent programmatic function of the building and provide a canvas in which the research will use to test their new developments. The interactive functionalism by design will be focused more on the interaction between the building and its components.

Within designing a building that is functionally interactive, there must be goals to describe such methods of function as described by the simplified functionalism of chapters previous. Goals with an idea of grandeur; with an idea of connection both literally and metaphorically. Metaphorically these goals are the conglomeration and intersection of
Figure (34) - connection between campus and community [University of Washington]
the culture and style, while literally providing university and community connections.

As research within the university grows, so do the ideas within the mind of the persons in each related sub-culture. With a portal to enhance and display their findings, they are able to help bridge the existing gap between internal and external culture.

### 3.1 Connections

One of the most important factors in this plan for a institution is the connections. As stated in the introduction to this chapter, connections within a project for a University needs to provide both literal and metaphorical meaning.

When thinking about the project at hand metaphorically, it is important to realize the strength that connections play within the overall goals of this ideology as stated in the chapter about culture. Without a connection between multiple departmental cultures, this idea would crumble and just be another research building with a university.

If such a situation in which all the metaphorical connections align and work together coherently, the project had developed into a idea that is stronger than a building with no inherent cultural connections behind it. With these connections as a backdrop, the building as a simplified functionalist space can begin to take shape. The physical connections needed to provide the cultural relationships explained lie in the ability to connect the campus with the community.

As architects, “The forms we generate and their underlying ideas can make a significant contribution toward creating that intangible and essential spirit of community. The very skills that form the foundation of our training and talents as architects can be instrumental in this effort: our ability to shape spaces for habitation; our appreciation of a building’s power to connect specifically with its site; our sensitivity to the qualities of light and climate that endow a place with unique character; and our understanding of proportion and scale as they relate to our bodies and spirits.”

This is the type of connection that places itself between the campus, the community, and making place.

Making this place is not as easy as designing a building that looks at both campus and community and then prescribes remedies individually, but rather a place where both are integrated together. “Campuses and their inhabitants constitute a distinct kind of community. With their special mix of permanent and transient populations and a broadly shared sense of purpose, these communities are defined and sustained by traditions, goals, and common experiences that profoundly inform the campus as place.”

On the other hand, The community within the

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1 Buzz Yudell. *Campus and Community*. Page 132
2 John Ruble. *Campus and Community*. Page 136
Figure (35) - new innovation in building skin design [hypo-surface]
surrounding neighborhoods and cities exists as a more permanent population that focuses on the everyday professional ideas of society in a more schizophrenic way. The connection between these two is paramount to the success of a university.

### 3.2 Innovation

Most architects would argue that they are innovative in their designs and material choices. This is simply not true, in The handbook of Advanced Materials: Enabling New Designs, James Wessel states, “Psychologists tell us that 5% of designers are willing to try something new and 80% will follow if the 5% are successful”. This statement is the precise principle in which the new a university with an innovative research ideology could benefit.

This notion of innovation comes from research and what it stands for. Inherently research exists as a way to discover what is missing in our society; with this in mind, Innovation is the payoff of research; its the method in which research can act as the communication between the campus and community, without which would prove impossible for a strong connection as well as advancement in today’s society.

### 3.3 Materiality

Materiality is the essence of all things; it is anywhere and everywhere. Material is used not only in architecture but in the construction of anything. Materials define our physical environment whether they are in their natural setting or used to construct. There are thousands of materials around the world; they can be natural or synthetic, advanced or simple, innovative or ordinary, new or repurposed.

“We live in a time of unprecedented material innovations that are affecting our lives. The accelerated pace of these innovations and the breadth of their applications have enhanced our awareness about new products and the ways in which they are transforming our physical environment.” With materiality playing such a large role in architecture, including it in the inherent function of the building is a very opportunistic way to show the community what the building is about.

With such a design ideology, it is important to capture these materials in a way that explains to the end user exactly what the material is and does. It is imperative that material should be selected for the nature of its existence rather than the perception it may give. Above and beyond, the building should accept the material that it creates open heatedly and not haphazardly; the systems with are the necessary backbone to the entire process and construction.

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3 Blaine Brownell. Transmaterial. Page 6
Figure (36) - building type that aligns with needs of university of cincinnati

Figure (37) - functional diagram that relates functionalism to the process in which a building is designed
3.4 Conclusion

Universities have a wide variety of building types; some have a completely different set that others. Within this realm lies many choices when it comes to connecting campus and community; each reserved for their own specific circumstances and none other.

Within the University of Cincinnati, a campus primarily centered around research, one of many potential choices is an Institution for the Advancement of Building materials. This decision came from not only the perspective of an architectural mind, but also a mind with an interest in construction, engineering, and business. Some might take an alternate approach, but fundamentally, this is the type of building that exemplifies university culture through multiculturalism, architectural style through a simplified functionalism, and innovation through research initiatives. The only real problem left is the actual production of design based around these ideas, which is shown in the following chapter graphically.
Figure (38) - Area Calculations overlaid on google earth

Figure (39) - Birds eye view looking east of the existing building on the proposed site
Chapter 4: Project

The overarching idea behind my thesis project is to decipher and develop the campus model and its presence in the community. I look at the university and its culture to determine the behavior of its users and how they use the campus. As I began this thesis process I realized a few goals that I am interested in architecturally. Like any architect my goal is to have users in the building. Along with the users, I am fundamentally interested in developing buildings that have a presence in the community. As you look through the figures in this section you will notice a linear progression that follows along with the ideas set forth in the previous chapters as I discuss each image individually.

As stated before the process in which the design has developed is based directly on the previous writings and ideas to develop the best theoretically real project. This starts by looking at the university as a whole and all of its subcultures and determining a project that the university might need; at least theoretically to prove this thesis idea. After determining the project outlines, determining the goals and objectives that the building should and will convey. At this point, the project that was agreed upon looked at the edge condition of the university and the underlying research goals of the university to come up with a project for a new Advanced Material Research Institution. The conceptual development of the project looks to develop the architecture by following the Interactive Functionalist ideas from chapter two.

The goals in the forefront of this Interactive Functionalism are defined as building that functions are shown in the building exterior in itself. This is broken down into smaller ideas that address the journey through the building and how it relates to the programmatic function and the exterior condition as well as the changeability of the material aspects of the building. These goals are explored throughout the figures in this chapter in both plan, section, and axon while all looking at the different goals.

As a result of this process there are many iterations of every aspect of the design process. The idea behind this new functionalist approach it to take a look every aspect of the design process in its own right and develop a list of ideas based on each. After this first step is complete, revisit each aspect with the knowledge gained for the first round of design to develop ideas that work cohesively with each other. This is the main process that was used in the initial design phases of this thesis design project.

The next step within the process, which is based on the previous ideas for the greater project and the conceptual design from the first stage includes looking into the more detailed aspects of the building; a different pace form the conceptual aspects of design. This process helped to develop the changeability goals in the front in of the design before they were overlooked and added as an afterthought.
Figure (40) - Level based site design considerations

Figure (41) - Plan based before and after circulation goals

Figure (42) - Developing basic goals that the building follows
Once all of these design ideas are worked out, it is time to further develop the underlying goals that were set forth before the design started to take shape. In this case, the journey or path through the building was looked at in more depth. After toying with many ideas that helped draw people though the building I have ultimately settled on a very concise straight path demarcated with the change of material within the floor plane. This decision took a lot of consideration and compared against a 45 degree switchback stair condition that forced the users to engage with the function within; in the end, this was counter intuitive to the original goal to get people who were not the predominate users to use the building as a means of travel from point ‘A’ to point ‘B’.

In the end, the building itself is a work of the architectural process and not just a building for the sake of a building. It can be looked at as a well thought out conglomeration of ideas that work together in such a way that the experience of such building from within and outside is enhanced. Designing for the campus and community is not a walk in the park, it is very difficult to weigh the needs of both and provide them within one project successfully.
Figure (44) - First iteration of programmatic development

Figure (45) - Second iteration of programmatic development
Figure (46) - Third iteration of programmatic development
Figure (47) - Small scale curtain wall changeability detail development

Detail Connections  Details  Section Detail  Plan Detail

Single Pane Curtain Wall  Double Pane Curtain Wall  Opaque Panel System

Single Pane Curtain Wall  Double Pane Curtain Wall  Opaque Panel System

Figure (48) - Small scale curtain wall changeability detail development

Figure (49) - developing multiple design goals at once, [structure, path, and level]
Figure (50) - Plan development, focusing on the major axis path through the building
Figure (51) - View examining the entrance from the north side of the building as it sits in the topography

Figure (52) - Explorations with path, structure, and form
Figure (53) - Section perspective addressing the idea of a switchback staircase with an atrium
Figure (54) - View from south-west examining the street presence

Figure (55) - Interior view of potential atrium design
Figure (56) - A look at 4 aerial views of the third iteration of conceptual design
Figure (57) - A look at the goals and programmatic arrangements within section
Figure (58) - Design development renderings
Figure (59) - Images of a laboratory at the University of Aberdeen

Figure (60) - Images of a laboratory at the Stanford University

Figure (61) - Images of Norman Fosters HSBC and the MIT Media Lab
Appendix I

University of Aberdeen

The Institute of Medical Science is a perfect example of a laboratory and research collaborative that adapts to its ever-changing needs.

When originally conceived, it was thought of as a ‘Research Hotel’, where research teams might expand or contract as funding comes and goes.

This design consists of one of two major programmatic layouts that a typical lab might have. The plan is arranged in such a way that similar program spaces are located in a cluster of their own, whereas the opposing design technique is to locate specific offices near specific labs or seminar rooms.

After reviewing this and the next precedent, I have determined that the idea of clusters would may work better. It provides researchers seclusion when they want to get back to the office and write.

It is at the University of Aberdeen in Scotland and was designed by David Murray Associates.

Stanford University

Foster and Partners were commissioned to do this project for The center for Clinical Science and research after winning a competition.

I picked this project to look at because they used the typical research lab building plan, providing offices near each lab building.

It is at Stanford University and designed by Norman Foster and Partner.

HSBC & MIT

Not only were these spaces a main source of lighting in the early days of architecture, many different types of building have successfully incorporated and used an atrium space to their advantage architecturally. The use of an atrium within my thesis revolves around the ideas of both movement and building interactivity. Within a research facility, like the ones shown here, it is important to be able so to see what is happening in each space from a central location.

The HSBC by Norman Foster is located in Hong Kong and was constructed in 1985. He used the atrium space for light, ventilation, views, and circulation within the building.

The MIT Media Lab by Fumihiko Maki is located in Boston, Massachusetts and was constructed in 2009. The atrium space within this building also uses ideas such as views and visibility within the interior spaces as well as connections between them as its main purpose. This building relates very closely to the overall ideas of the thesis at hand.
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