GUIDELINES TO CHANGE THE CULTURAL PARADIGMS OF DESIGNERS

TOWARD THRID WORLD PEOPLE GROUPS THROUGH MISSIOLOGY

TO INFLUENCE FURNITURE DESIGN

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Third world culture has been invaded by the western world. It is an issue that grows everyday with the media influences of western culture. Industrial designers have developed many of the products and systems which act as such a strong influence. It is now time for the Industrial Design community to change its mentality to a role of support in making the world a better place to live.

The design community can use the help of the Christian mission agencies to aide in meeting the physical, emotional and spiritual needs of third world people groups; some whose cultures are now in jeopardy because of the influence of the West. This thesis addresses the problem of cultural security through the use of furniture design.

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1.0 INTRODUCTION

Industrial Design, as a profession, seeks to develop products and systems which will interact with the intended user in a positive manner. It is a purpose driven field. This will remain the same no matter how different individual definitions may become. The typical mentality of the industrial designer, however, is formulated for the "first world" client. The first world, though a term left over from the Cold War, is used to describe those countries who are developing economically and technologically in modern society; these countries are mainly located in North America and in Western Europe. A main issue is the fact that only about 20% of the world's population can be categorized as living in the first world. Without "first world" criteria, the average designer could not offer any assistance. This paper proposes that unreached people groups throughout the world could benefit from the skills and efforts of industrial design. The industrial designer, however, needs a new set of guidelines that can help them use their design skills and methodology to aide users with these different needs.

In order to achieve a new cultural paradigm, the field of Industrial Design needs a pattern by which its members can model their efforts. Christian mission agencies around the world currently exist and can offer such a model. These Christians travel throughout known and unknown geography in order to meet the physical, mental, and spiritual needs. In their long history of sending out missionaries these agencies have applied several methods to develop a relationship with those they are trying to help. Within the past 100

years, their approach has become focused on the evangelization of “unreached people groups.” These people groups are often in third world countries and have needs unique to their culture. These countries are classified as third world because of their poor development both economically and technologically. This most recent approach has opened avenues for more specialized groups to offer assistance.

The purpose of this paper is to show the differences between the first world mentality of designers and the needs of unreached people groups within third world cultures. Because the needs for any culture, no matter how wealthy or technologically adept, are vast and cover many fields and focuses, this paper will be using furniture design as a catalyst for its theories. Furniture is a representation of the lifestyles, skills, and uniqueness of any culture. Furniture is also a large part of the home, workplace, and social events for cultures. The high frequency of everyday use suggests a greater need for furniture than for other products. Finally, furniture is a strong field in which industrial design is highly used in first world countries which will provide an easy comparison between the current design perspective and the one to be proposed in the paper. The following figure (Figure 1) illustrates the direction of this paper.

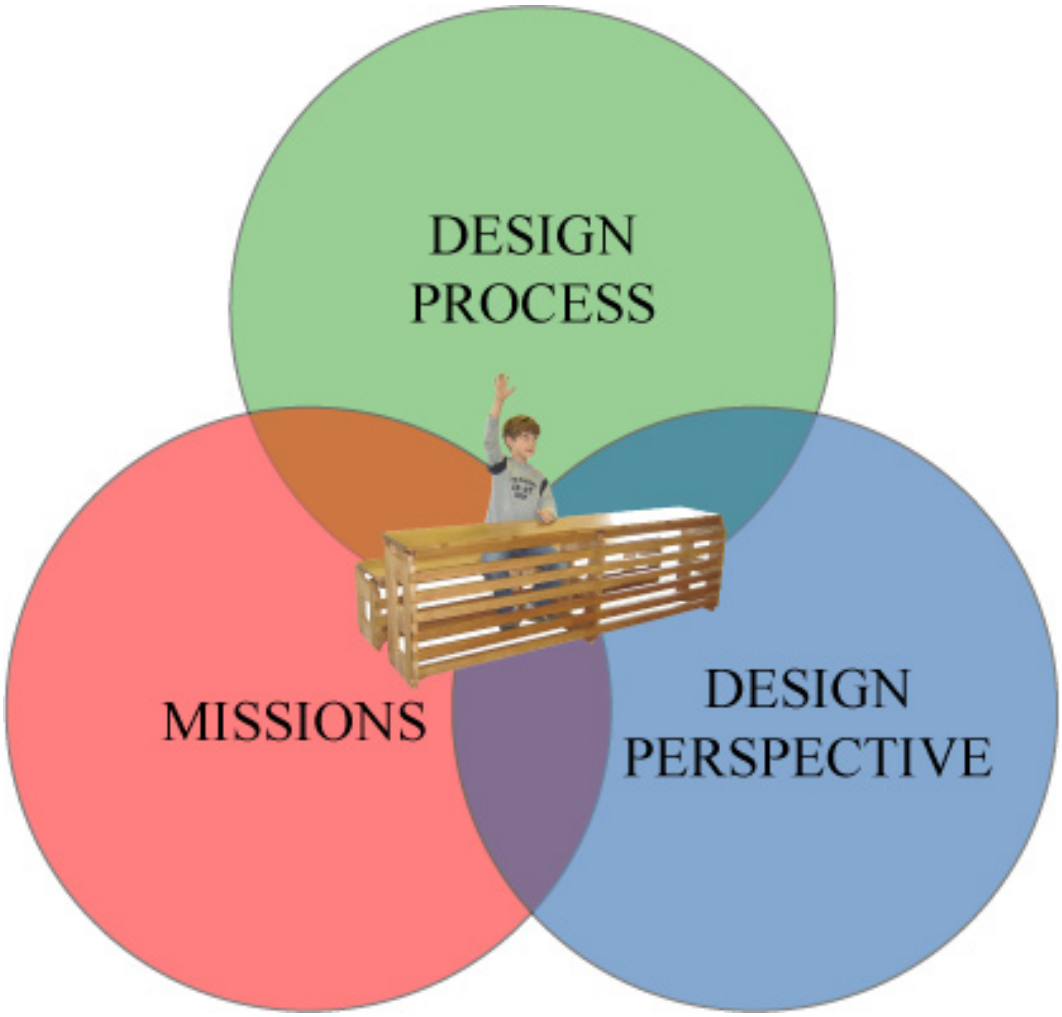


Figure 1

2.0 LITERATURE REVIEW

2.1 Design in the First World

Since the development of the field of Industrial Design in the early Twentieth Century, a basic design process (also referred to as “problem solving”) has been outlined. Though the specific definition of industrial design differs from one designer to another, the processes most designers have used to solve problems remain very similar. Marjorie Bevlin, in her book *Design through Discovery*, states, “Problem solving consists of five stages: definition, creativity, analysis, production, and clarification” (1994). The stages, or steps, in the design process may differ when stated in order of usage, but they carry the same primary elements. Of the steps utilized by most industrial designers, the following list has been compiled of the most common: (1) definition of the problem, (2) research and data collection, (3) conceptualization, (4) refinement and testing, (5) communication. This broad list encompasses the majority of design projects for first world markets.

2.11 Definition of the Problem

George Nelson, industrial designer and author of the book *Problems of Design*, explained the origin of many design projects. Nelson begins, “We learn from daily work at our trade that the design process usually begins with a specific problem” (1957). This specific problem is often defined at the inception by a client for whom the designer is working. The most common form of this definition is a brief. "It [the design brief] presents the designer with all the information available about the problem and lists all the

things that need to be considered," explains David Wise, author of *Design in Focus* (1990). The brief, and whatever else the client may offer in the form of information, is all the designer may have to work with before the project is begun. Sometimes, however, the designer can also bring their own knowledge of a subject, or closely related subjects, to a project.

Before a designer moves from the brief or simple project description, they should devise a problem statement. This is because, Wise asserts, "it is important that the designer is given a clear definition of the problem" (1990). This statement is a concise wording of exactly what the desired outcome of the project is. Without clear communication of the problem, the designer and their client may find it difficult to attain the same desired result. The problem statement is, however, subject to change during the course of the design process when required; it is primarily used as a course setting to keep the project focused. The brief is constantly referred to throughout the entire design process, and is what determines whether or not the project is a success.

2.12 Research and Data Collection

After the project has been properly defined, the designer must seek to find out as much about the subject as he/she can. In his book, *The Practice of Design*, Milner Gray discusses how and where a designer may retrieve this information. The designer, Gray suggests, "will collect data from the manufacturers' sales department covering all the relevant aspects of the product- the price-class in which the product falls, the market at which it is aimed, and, if any previous models have been produced, their virtues and defects in the light of the manufacturers' experience of sales" (1946). In addition to collecting data from within the company for which the design is being developed, the

designer “will make a general analysis of competitive products” (Gray, 1946). The designer “will study the manufacturers’ present plant and organization” and must also observe and understand available and/or potential manufacturing techniques for the company. Research is required in order to better understand the needs of the client and user. During this step the designer must determine the criteria and goals of the design project, and because every product or system is different, each will have unique results. Gray explains further, “The period necessary for this exploratory work will vary considerably with the nature and extent of the assignment” (1946).

Harold Van Doren, in his book *Industrial Design, a practical guide*, outlines the mentality, skills, and duties of an industrial designer. In addition, Van Doren mentions in further detail a few of the areas where this research may be practiced (1940):

1. The client (sales department and salesmen, engineering and production department, service department, advertising department)
2. The product itself
3. The point of sale (retail store, manufacturer representative)
4. The user
5. The key buyer
6. The tradeshow (viewing all products in a market simultaneously)
7. The trade publication (devoted to an industry that shows trends)

The research phase, as well as varying in length, may even overlap into other stages of the design process as issues arise. The initial background research, however, cannot be postponed until after the designer has moved on to other stages in the process. This is because it is research that separates purpose from whim. Karim Rashid, a popular

industrial designer of the early Twenty-first Century, explains his method of research in his book titled *Evolution,* "I learn everything about a project, the culture of the company, the production, materials, market, and costs, everything that I can in the shortest amount of time possible" (2004). Fully informing a designer about a project cannot be replaced by any amount of conceptualization, modeling, or testing.

2.13 Conceptualization

Once the designer has a firm grasp upon a problem to solve and all the relevant background on the subject, they begin to conceptualize for the project. This stage consists of as many ideas on how the problem could be solved as possible. "Problem solvers recommend the practice of 'brainstorming'… regardless of how weird they may seem" (Bevlin, 1994). Brainstorming, though seemingly irrational to an observer, can be one of a few ways that a designer can "voice" his ideas for immediate feedback.
In reality, brainstorming may even occur before the research stage. There are two main reasons for this: (1) after having the project completely defined, the designer may have immediate ideas for the project that they need to discuss and/or "put down in writing", (2) the designer may want to consider some ideas before they are biased through research. Though these ideas will be refined through research, the benefit is innovation without limits; research then solidifies the potential of a concept. "Preliminary rough sketches are made, and engineering problems are considered in the light of the consultant's knowledge of the producer's capacity. Many sketches and roughs are discussed and ruthlessly considered," explains F.A. Mercer in his work, *The Industrial Design Consultant* (1947). No matter if a designer uses brainstorming or another technique for inspiration, the purpose is to offer as many options of solutions as possible.

2.14 Refinement and Testing

After the concepts are presented, more development must occur. "This is the stage at which any problems are dissected and viewed from new angles, with subsequent adjustments made in the design" (Bevlin, 1994). Often discussions are held between the client and designer to obtain approval to continue the design process into this stage. Designs are chosen, or discarded, usually based on the client's preferences. After general approval is met, the designer may also discuss the proposed solutions with engineers or other industry specialists as to the plausibility of the concept.

"Agreement being reached, models may be built and tested and perhaps a 'mock-up,' a full-scale model, is prepared" (Mercer, 1947). Without a scale or full-size model to better understand the concept, the designer, and others involved, may not be able to grasp a concept's full proportions. "The concept is also fully tested to discover any flaws in the design. Experiments may be made to discover whether proposed methods of production are feasible… the whole process will then be repeated until a solution is reached which appears to satisfy all requirements" (Gray, 1946). These "flaws" must be resolved before expensive tooling can commence.

2.15 Communication

The final stage in this design process model is the communication of the project's final solution by the designer to those who will take over for the production process. In this step, the designer must prepare preliminary drawings with proper scale and accurate measurements. The preliminary drawings are refined as technical drawings by the engineers, often under the advisement of the designer. "From these drawings prototypes and final tests will be made… These may disclose the need for further revisions before

the last stage, when a final prototype is made and full-scale production is begun" (Gray, 1946). The designer may even play an early role in the production of the product and act as a maintenance supervisor "after the product is marketed" (Mercer, 1947). Ultimately the designer hands the project completely over to the client, and the designer moves on.

These five stages of the design process can often overlap, as explained by Mercer:

> "This outline of procedure must not be regarded as implying a hard-and-fast rule…Different problems will involve different methods, simpler or more complicated according the magnitude of the project. Sometimes no finished drawings are ever completed, but the work is done directly on model or "mock-up." The order of procedure may vary, parts may overlap, some details may be finally settled before the whole" (1947).

The design process, though quite varied between designers and projects, still must contain these basic elements in order to create a successful product for mass reproduction within modern and flourishing nations. The absence of these elements, however, will remove industrial design's distinction from artists and engineers.

2.2 Motivation behind First World Design

"Every design is a complex of many factors: sales, engineering, production, costs, competition, tradition. Many other things form a running accompaniment to those main themes, among them such intangibles as the human equation, politics in the plant, and your personal relations with various members of the staff" (1940). Van Doren points out that design for the modern world consists of many different variables, and not just better products. There is a noticeable difference between those necessary elements of the design process listed in the previous section and the factors that Van Doren states are actually present. He is not alone in his assumptions, however. Gray states his purpose

for the industrial designer: "He is concerned not only with how things are made and how they will work when they are made, but with marketable commodities- that is goods with a human appeal over and above their functional value" (1946). The presence of these extraneous factors in design represent a mentality that is prevalent within the first world: that design requires more.

It stands to reason that design can often serve a higher purpose than simply function. Karim Rashid agrees that design should encompass our entire lives, and not just the products we use. "I like design that traverses the boundaries of the associative and touches on the sensual, one that goes beyond the modernist doctrine of *bienahe nichts* (almost nothing)" (2004). Rashid even describes his own work as "Sensualism (sensual minimalism)… contraindicting minimalism; it is about having only what is essential, but with a friendlier, engaging, and organic relationship" (2004).

What designers often dislike to admit is that beyond their "higher definition" of design there is the motivation of profit. Very few designs today are created without a consideration for cost and profit margin. A new product will often be introduced into a market with intentionally fewer functions. The purpose is to prepare for future models with added "improvements" in an attempt to create a greater demand for the product later. Designs are no longer developed to improve efficiency of use, but to improve a producer's revenue. Because of this, good design is replaced by a higher profit margin. The need for new design is no longer as prevalent in first world countries, and therefore new methods of continuing demand must be created.

2.21 The Cost Factor

Beyond their personal definitions designers in the modernized first world work for the same basic reason: they want their designs to succeed. The proof of their motive is in the reasoning behind their designs. The first point that Van Doren made was that of the complex factors which make up a successful design, "cost and competition" rank very high. The terms that most designers work under is "when final agreement has been reached on all aspects of production, including the vital one of costs… full-scale production is begun" (Gray, 1946).

Cost is one of the number one factors for a company to consider a project. Without an appropriate profit margin the company will, in fact, fail and die. Mercer also points out the necessary emphasis on pricing and cost along with the other functions of a product: "It should be remembered, however, that good industrial design involves much more than styling. It includes efficiency, economy and ease of maintenance, as well as correct appearance" (1947). Economy, here another reference for cost, is again listed as a major factor for good design. This should not be considered a negative trait of first world design, simply that cost is a major concern for any design which will be mass produced. It has, however, blurred the line between designs that are necessary, and designs that are simply created to make more money.

2.22 The Failure of "Pop" Design

A practice of design for popular culture, or "pop" design, is becoming prevalent in first world societies. The issue of "pop" design is less of necessity and more of trendy styling. Koichi Ando, a modern furniture designer in Japan, points out how design has affected his society: "The society has developed into a consumer monster within which

designs have a symbolic role to create a difference of economic value rather than function. Japan is becoming a society where design determines the trends of the economy" (1990). The power to motivate and sway a culture can be very self-fulfilling.

What designers often fail to admit is that behind their personal philosophy for design is their desire for success and recognition. Once this occurs, mentalities like the one illustrated by George Nelson begin to occur: "One of the leading members of our profession stated that the major social contribution of the industrial designer lies in the new comfort and ease he has created for the public" (1957). This mentality will create a comfort driven society with less regard for true purpose. It will also contribute to an attention depleted culture that constantly requires something new anytime they become uncomfortable. Rashid envisions such a society when he says, "I think that in the future we will have many more products and experiences but we will own nothing- we lease cars, we lease houses, and soon we will learn to lease everything, experience it for a short while, and move on to the next thing" (2004).

If "pop" design continues to fail at providing for a culture's needs than a new mentality must be used. New designs cannot continue to cycle out every six months. The design process, just like the products and systems it develops, must also reflect this new mentality of more purposeful design. Victor Papanek, author of *Design for the Real World* and endorser of humanitarian design, comments that, "design is the conscious and intuitive effort to impose meaningful order" (1984). Industrial design will never impose truly "meaningful order" until it begins to meet the needs posed by real problems, and stop answering to fashionable trends. Wise reminds us, "Styles and tastes change" (1990).

2.3 Meeting Needs with Design

Most people who utilize modern design are the affluent and popular. These are the people Nelson describes as, "a society which is dedicated- on the surface at least- to the creation of a civilization of super-comfort" (1957). The vast majority of the world's population, however, has little need for more comfortable products. Design has often purposed to create products and experiences that improve the lives of the user. The motivation behind this varies; some do it out of duty, and others out of obligation and still others use design as a tool to meet the needs of people in every facet of their lives. For two-thirds of the world's population, design, no matter how beneficial, is a luxury and not viewed as a necessity. This is not the raw design of invention, such as the wheel, but design that refines man's interaction with his environment.

Karim Rashid states, "Design was to be based on the ultimate and most reduced structure to achieve a "pure," minimized condition" (2004). This mentality can only be held by the wealthiest countries in the world. A weighted average income of the top 150 countries in the world is only 5,002.39 USD, with half of those countries making less than 2,000.00 USD (www.nationmaster.com). With each country there is a new and different culture, as well as standard of living. The fact remains, however, that designers have focused their efforts mainly where they were least needed; but where they were offered the most money and the biggest budget.

Bryan Lawson, in his book *How Designers Think*, describes how a shift in mentality must occur for the designer to actually design products and systems for people in a different culture:

> "The unselfconscious craft-based approach to design must inevitably give way to the self-conscious professionalized process when a society is subjected to a sudden and rapid change which is culturally irreversible. Such changes may be the result of contact with more advanced societies… in the more insidious infiltration caused by overseas aid to the underdeveloped countries" (1980).

The solution is a new kind of designer, one who "evangelizes design" and one who evangelizes *with* design. This designer will be a missionary, a *design* missionary who will promote the improvement of peoples' lives through the design process. In order to truly accomplish this, the designer must also learn the methods of a missionary. This new method will complement the current approaches of the Modern Mission Movement to use "specialized" mission agencies to accomplish the task of evangelizing the unreached people groups left in the world. Industrial Design can come alongside this movement to engage designers with a new mentality.

As author and missionary Ralph Winter states, "New technologies [are] necessary for the reaching of tribal and other isolated peoples of the world" (1977). Design, with its many abilities and specializations, can adapt well to cultural needs. Within tribal and poverty-level areas of the world, design can provide economic and functional improvement. Technology used in helping these people groups will attempt to implement more sustainable and durable solutions, and will seek to address problems specific to a culture. Wise agrees that design solutions are specific to every scenario: "Designs also fail because they do not satisfy the needs of the people for whom they were intended. A product must perform well, but also look good. Styles and tastes change" (Wise, 1990).

2.4 Conclusion

As industrial design has developed in its relatively short lifespan, it has now come to the point where designers can select specific fields of study in which to work, or specialize. Some designers have the option to adopt the cause of design for the less fortunate instead of design for luxury. When this occurs, a completely new set of paradigms (mental patterns or models for social behavior) from those of the first world must be used for the design of products and systems. Papanek states it this way: "'do you want it to look good or to work?' Barricades are erected between what are really just two of the many aspects of function" (1984). By adopting the mindset of the Modern Mission Movement, designers can adapt their design skills to aide those less fortunate.

3.0 UTILIZING FURNITURE DESIGN

3.1 Furniture Design: How it defines a Culture

> "Design is becoming an aesthetic function which makes us reconsider the meaning of culture in the capital activities" (Ando, 1990).

Design can truly have the ability to shape a culture. Some may believe that in order to shape a culture it would take a vision of the "great picture" of a society to plan out how the culture would develop. A more plausible explanation is the use and appearance of everyday objects and actions. Paul Hiebert, professor of mission and anthropology at Trinity Evangelical Divinity School, defines culture as, "Culture also includes material objects- houses, baskets, canoes, masks, carts, computers, and the like" (1976). Hiebert goes on to explain how cultures are built from their surrounding, "People live in nature and must adapt or mold it for their own purposes. Most traditional societies live in an environment largely formed by nature, in complex industrial societies, much of the human environment is culturally molded" (1976). According to Hiebert, taking any one object or action and changing it can greatly manipulate an entire society.

Furniture, and furniture design, is an area that helps to define a culture. John Gloag, an expert on the history of furniture design, explains how furniture can have such an impact on a culture: "Furniture reveals many confidential things about the social life of the past and present; like architecture it amplifies and illuminates the story of civilization in nearly every country, and provides an intimate, personal record of habits,

postures, manners, fashions, and follies" (1966). A piece of furniture will often reflect how a people group interacts with one another, their traditions and customs that distinguish them from another group. For example:

> "There is a difference in the sitting ritual between Western people and Japanese people. Perhaps the sitting technique takes a major part of our body movement, and there are great influences of how things and spaces should be. For a long time, we have lived in an environment in which we sat directly on the floor. There is a manner to sit square or cross-legged, which is different from sitting on a chair… the difference [is] in manners by ethnicity in different cultures, and the tools that were invented as an extension of the manners, thereby generating a difference in cultural things and spaces" (Ando, 1990).

The pattern of sitting and the subsequent chair designs distinguish one culture from the next. This example illustrates what occurs in nearly every product which attempts to capture a cultural style. Even the material chosen for a society's furniture reflects their skills in using the material, and their consideration of the environment around them.

"Differences in national and racial habits are also disclosed by the dimensions and design of such articles as seats and tables" (Gloag, 1966). Furniture can become a piece of history for a specific people group or society, "the most highly valued possession of a primitive tribe may be a carved seat, used exclusively by the chief and therefore a symbol of authority" (Gloag, 1966). Culture based furniture does not have to be in a primitive setting of a tribe, "the Chinese, Japanese, Burmese, Hindus and some nations of the Middle East sit with their legs comfortably arranged in a horizontal position, a posture that affects the design of their furniture" (Gloag, 1966).

"Design forms part of our culture and embraces all types of items. Designer goods cannot be understood if they are divorced from their economic, political, social,

cultural or technological contexts" (Asensio, 2002). Since furniture is such an integral part of a society and culture, it is important that careful design go into new and innovative pieces that the people may require as their needs change. As cultures change and interact with on another, there will be a need for new furniture that expresses the evolving culture in combination with the newly required functions.

3.2 Furniture Design within a Missions Context

Long-term missionary and author of *Culture, Worldview, and Contextualization,* Charles Kraft connects Christian missions and product design when he states, "Biblically, the contextualization of Christianity is not simply to be the passing on of a *product* that has been developed once for all in Europe or America. It is, rather, the imitating of the *process* that the early apostles went through" (1998). The principle behind raft's statement is that each culture needs its own products and systems, designed for them. The myth of the "white man's burden" does not stop at political or religious reform; but carries over into the everyday items people use and wear. Designers are very guilty of this, mainly because they bring their own fixed paradigms and ideas into every project. George Nelson, commented on this issue:

> "The designer brings to the problem his own private baggage, his personal collection of images and the individual philosophy he holds whether he is aware of it or not. No matter how objectively the designer attempts to view his problem, he is conditioned at every stop in the design process by his accumulated notions of workable solutions, appropriate shapes and forms, and so on" (1957).

There is no easy solution because bringing previous knowledge into a design project is not bad in itself. All people, including designers, build upon their experiences. It is

necessary, however, to learn the perspectives of others and to appreciate them as separate people with unique needs.

The position furniture has in a culture reflects the status it holds for the people, but it also reflects their quality of life. Western society utilizes plush pieces of furniture that endorse comfort, while a nomadic society will have furniture that is easy to carry and breakdown and setup. Though the aesthetics of furniture are often the most noticed, the function of the piece must be perfected in order to feature those aesthetics. It is both the aesthetics as well as the function, however, that must showcase the culture they represent. "In fact, most design is based on common sense and the remainder- a very small part- is devoted to aesthetics and appearance" (Asensio, 2002).

Furniture design creates avenues for a missionary to enter into a culture where there may be no other way. "Because we live in a society which has come to rely heavily on language as a means of transmitting increasingly complex ideas and instructions, we tend- quite naturally- to think of communication as a process rooted in the use of words… we know (however) that communication has to do with more than the spoken or written word" (Nelson, 1957). Communication is what the missionary needs, and communication is what a designer does. Rashid comments on communicating design through sketching and emphasizes its importance when he states, "Drawing is a fundamental element of communication" (2004). Though drawing is also not the only way we communicate, it is still an excellent method. Drawing can be universal, and if the designer is able to convey ideas correctly through drawings, they can shorten the time it may take to truly breakthrough and work with a people group.

The goal of many mission agencies is to improve a people groups' physical situation in order to gain permission to work with them on their spiritual situation. "Design has often been defined as the conception and elaboration of all the objects created by human beings, as a tool to improve our quality of life" (Asensio, 2002). As the need for the professional missionary increases, the use of industrial designers seems more logical. Design, whether in a first or third world country, can offer economic, social, and technological improvement. "Broadly speaking, all furniture is derived from four basic elements that appear in the lives of human beings… the chair, the table, the chest and the bed" (Asensio, 2002). Furniture design in missions can take these four basic elements and help to turn peoples' lives around.

"The industrial designer is not called upon to make the article he designs, but to plan it in such a way that it may be made by others" (Gray, 1946). The unique thing about furniture design in missions is that, the solution must be turned over to the people for them to manage. In Figure 1 for Mission-Church Relations, the method for removing the missionary from the scenario is pictured. The goal of every mission design project will be for the people to take control of the project to sustain it and to reap the economic benefits.

Stage One: Pioneer

Requires gift of leadership, along with other gifts. No believers- missionary must lead and do much of the work himself.

Stage Two: Parent

Requires gift of teaching. The young church has a growing child's relationship to the mission; but the "parent" must avoid "paternalism."

Stage Three: Partner

Requires change from parent-child realtion to adult-adult relation. Difficult for both to change, but essential to the church becoming a mature "adult."

Stage Four: Participant

A fully mature church assumes leadership. As long as the missionary remains, it should use its gifts to to strengthen the church to meet the original objectives of Matthew 28: 19-20. Meanwhile the mission should be involved in Stage One elsewhere.

"Therefore go and make disciples of all nations, baptizing tham in the name of the Father and of the Son and of the Holy Spirit, and teaching them to obey everything I have commanded you. And surely I am with you always, to the very end of the age."

- Matthew 28: 19-20

Mission Church Relations: 4 Stages of Development
(Winter, 1999)

Figure 2

3.3 Manufacturing vs. Craft

"There were two prime causes of the betrothal of art and industry: mass sales of identical objects, and competition" (Van Doren, 1940). Industrial design has a direct concern for mass production and the need to compete with similar products. This

concern causes a major separation between the arts and what makes up industrial design. But without these two qualifications, industrial design can still exist. There is no required number for how many reproductions must occur for a project to be considered "mass produced", in fact, industrial designers can have projects which only produce one-of-a-kind pieces (i.e. monuments, custom cars, and jewelry).

The major requirements for design are spelled out by George Nelson:

> "For a design to emerge at all, a definite situation has to exist. There has to be a need- or at least a possible use for it- and there has to be a designer. The designer may call himself a farmer or a machinist… it doesn't matter particularly as long as there is someone around with the urge and the competence to give form to an idea" (1957).

With these basic requirements, design can occur in almost any locale. "Design came into being to take advantage of technological developments… and it grew into the esthetic revelation of the twentieth century by becoming a part of everyday" (Asensio, 2002). The issues of quantity and competition need not be concerns until the design process has actually begun. Where there is a need and a designer, there is the potential for industrial design.

The distinction between a craft and the work of an industrial designer must still be addressed. Some would believe that "by limiting our horizon to articles made by mass-production techniques, we automatically shut out several fields where artists have been traditionally an important factor in manufacturing and merchandising… the manufacture of engineered products like typewriters, utility and price were the prime concerns of the manufacturer and purchaser alike until a few years ago" (Van Doren, 1940). This may

have been true at the birth of industrial design, but today, with the advancement of technology, many of these same products are manufactured in automated, or semi-automated, factories. Even if they are produced completely by hand, these products require just as much design input as any other product.

It is merely a convenience and a technicality that the role of designer and maker are often separated in first world modern society; it has not always been the case that this has carried on like this. Lawson warns against this, "the separating of designing from making had the effect not only of isolating the designer but also of making him the center of attention" (Lawson, 1980). This being so, some still believe that the designer's job ends with the handing over of their plans to production; "from then on the designer never touches the actual materials again; the process of reproduction in countless thousands is the work of cold steel, guided by alien and often indifferent hands" (Van Doren, 1940). This conclusion is made because "every product of the craftsman bears the maker's personal mark. The products of industry bear only the impress of the designer's mind" (Van Doren, 1940). If the designer is separated too long from the making process, however, they will become unfamiliar and ineffective.

The mentality that design is supposed to remain separate is naïve, even to those who believe it. Van Doren states that "[at the] back of all man-made articles has been design effort of some sort" (1940). Design cannot be separate from the manufacturer mentally, and often physically. Even in modern society the designer often acts as a consultant for the factory, and in smaller factories the designer may still help with the production.

Van Doren may concede the previous point somewhat, but only for machine-made products. Those products made manually, or by hand, he considers a "craft":

> "Wooden furniture and hollow silverware (as distinguished from flatware) must also be excluded [from industrial design]. Their manufacture is still largely manual and involves problems of craftsmanship so remote from those of the mass-production industries that they can hardly be discussed in the same volume" (1940).

Again, simply because a product is produced at a smaller scale does not discount it from the realms of industrial design, particularly in products which are handmade.

3.4 Conclusion

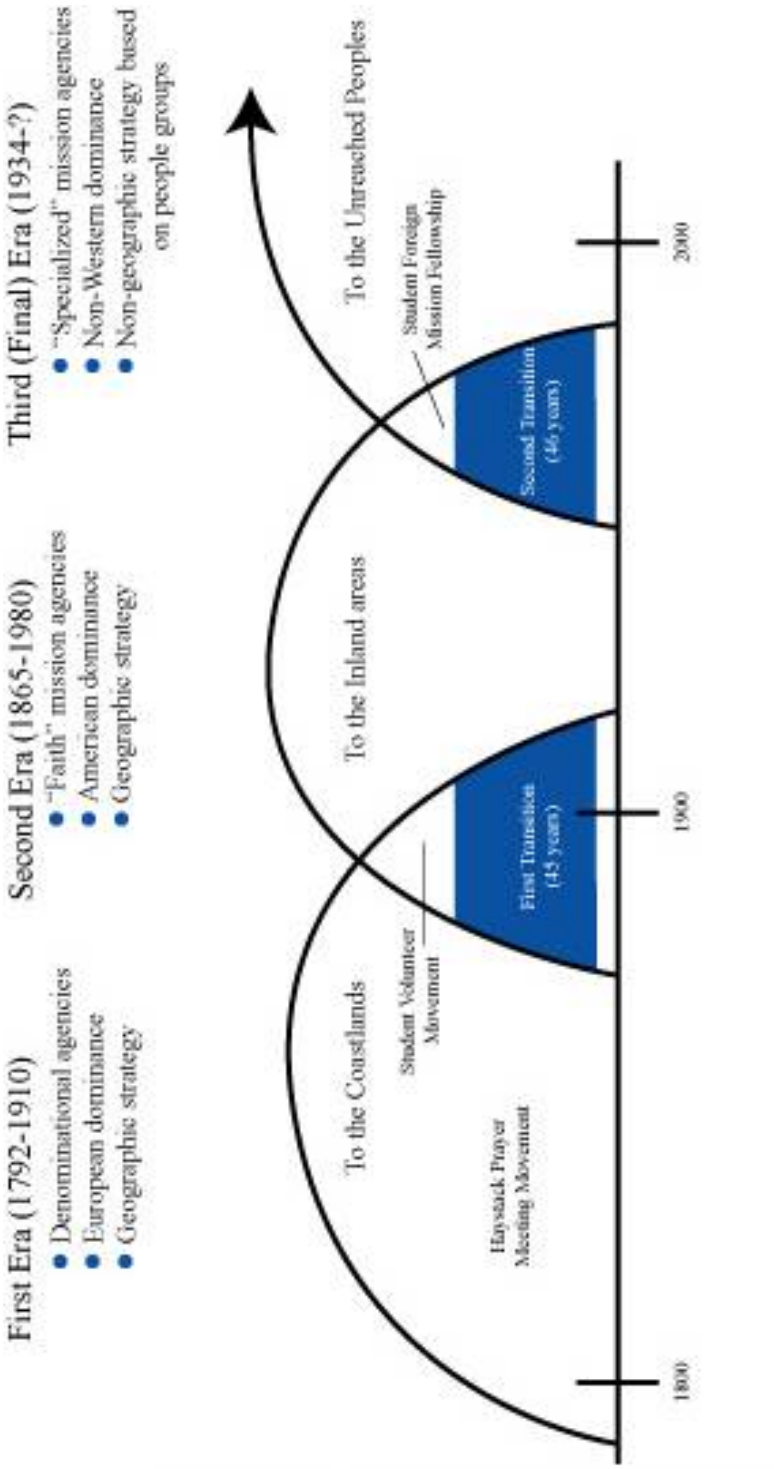
In an effort to keep the people's culture vital, the designer can use furniture design as a means to maintain a cultural standard, while improving their manner of living and helping to encourage them. Furniture design helps maintain a culture in two distinct ways, by bolstering a people group economically, and by helping to solve problems in a culture's everyday life. Furniture can be sold within a culture to meet an existing need. Or a market can be located where the furniture can be sold for profit. If furniture is not sold outright, the resulting techniques taught by the designer can improve the skills of the producers and improve the quality of their products. These skills can be taught to succeeding generations or outside groups in order to improve the lives of a greater body of people.

4.0 COMBINING MISSIOLOGY AND DESIGN

4.1 Design in Missiology

The first question of the Westminster Catechism, which was compiled by the Assembly at Edinburgh in 1648, is, "What is the chief and highest end of man?" And the response is, "to glorify God, and to fully enjoy Him forever" (www.reformed.org). Because of this love for God (the God of the Bible), the evangelical Protestant Church worships and obeys Him. This worship and obedience to God has prompted the Protestant Church to send out its members with a mission to spread God's Gospel (the good news of Jesus Christ, God's son, and His death, burial, and resurrection) where other people do not believe in and worship God. Simply put by John Piper, author and pastor of Bethlehem Baptist Church in Minneapolis, MN, "missions is not the ultimate goal of the Church. Worship is. Missions exist because worship doesn't" (1993).

The modern mission movement within the Protestant Church is divided into three eras: the first from 1792-1910, the second from 1865-1980, and the third and current era from 1934 until today. The diagram below (Figure 2) explains the different groups involved in each era, the dominantly active people group, and their geographic strategy. The current era, as described by Winter, "must be characterized by the more difficult-to-define non-geographical category which we have called 'Unreached Peoples'- people groups which are socially isolated" (Winter, 1977).



Three Eras of the Modern Mission Movement
(Winter, 1999)

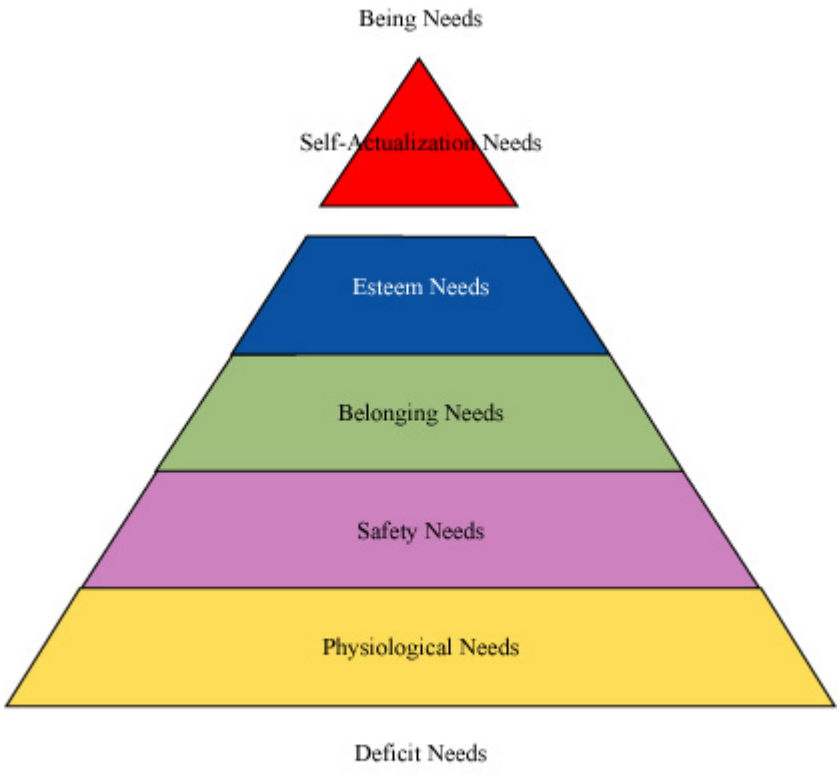
Figure 3

The belief of these Christians is convicting enough that they will "endeavor by all methods to bring over a lost world to God," as stated by William Carey, the "father of Protestant missions" (1792). The "lost" to whom Carey is referring are those people who do not believe in and worship God. The Protestant Church has agreed with Carey, and believes that all should have the opportunity to hear and believe God's Gospel; because, as stated by retired missionary and author Johannes Verkuyl, "God's work and activity are directed at the whole of humanity" (Verkuyl, 1978).

Church and Para-church organizations are attempting to interact with these newly defined people groups, but the approach must be different. "We almost need to reinvent the wheel as we learn again how to approach groups of people completely untouched by the gospel," Ralph Winter, Professor of Missions at the School of World Mission at Fuller Theological Seminary, "we know there are about 10,000 people groups in the "Unreached Peoples" category, gathered in clusters of similar peoples, these clusters numbering not more than 3,000. Each individual people will require a separate, new missionary beachhead" (1999). The new approach to unreached people groups must employ specialized and focused missions agencies and organizations that can meet the specific needs of each unique group. Very often, these needs are first met physically before they are met emotionally or spiritually. Industrial design, as a profession, has not been utilized greatly by the Protestant Church in their mission efforts; but hopefully the two fields can be joined with this common bond. "The reality is that design is often more of a repair job. Part of the problem is in correcting something which has gone wrong in some way" (Lawson, 1980). In the vast options available at the beginning of a design project, many options will automatically be eliminated based on available resources;

"some decisions automatically eliminate others" (Bevlin, 1994). The major deciding factors are the needs the designer will address.

The psychological theories of Abraham Maslow help to define what needs should be met first within a people group. While serving as the chair of the psychology department at Brandeis, Maslow theorized that some personal needs take precedent over others. "Maslow took this idea and created his now famous hierarchy of needs… he laid out five broader layers: the physiological needs, the needs for safety and security, the needs for love and belonging, the needs for esteem, and the need to actualize the self, in that order" (1973). Maslow developed a visual pyramid which displays the foundational, building aspect of his theory (see Figure 3). Maslow argued that before a higher need could be addressed, the previous, more basic needs must first be satisfied. The needs of the unreached people groups will be lower, or more foundational. Maslow's theory will help the designer better identify the focus of their efforts.



Maslow's Hierarchy of Needs (1973).

Figure 4

4.2 The Need Base

It should be noted that both missions and the industrial design process can be autonomous in themselves. The purpose of this study is to discuss the merging of the two into mutually beneficial fields. As the two merge with the focus on furniture design, the spiritual, economic, and humanitarian positives will be made known. Some potential pitfalls will also be discussed, and some possible solutions.

4.21 Introduction to another Culture

"Culture is 'the more or less integrated systems of beliefs, feelings and values, and their associated symbols, patterns of behavior and products shared by a group of

people'" (Hiebert, 1976). Culture is where people turn when they need to know the answer to a question concerning nearly every aspect of their lives; including: social, spiritual, familial, and even personal questions. "Cultures are but different answers to essentially the same human problems" (Kraft, 1998).

This does not mean, however, that culture dictates every aspect of our lives. There are even times when we choose to go against culture. Paul Hiebert suggests, "Not all behavior is culturally shaped. In formal situations, behavior and speech are carefully circumscribed by the culture. Everyday life is usually less formal; we are allowed to choose from a range of permissible behaviors" (1976). No matter how much a person chooses to subscribe to their culture, it is still a major part of their lives which they do not remove completely.

In order for a design missionary to enter a culture they must be prepared to learn it. This can only be done through immersion. The reason for this is that cultures have certain paradigms which dictate personal relationships, and a missionary or a designer cannot hope to aide a group of people without communicating with them. Communication is not the first step, however, trust is. "The missionary who is immediately immersed in the local community has many advantages… like the first day of an infant's life, the first two or three weeks of a newcomer's stay is of crucial importance" (Brewster, 1999). The people group the design missionary is trying to aide must trust them. "You must prove," states author and minister Don Richardson, "that you want to help them, by giving them food, medicine and shelter, teaching them, and learning their language…I guess what you're looking for is the cultural key, the key that unlocks the culture and opens the way for the gospel" (1999).

Basic communication can be blocked by cultural differences, often because of a language barrier. In regards to the language barrier, Tom and Elizabeth Brewster, in their book *Language Acquisition Made Practical*, state, "We have found that a prior preparation of perspective and expectations is helpful, along with training in how to develop language learning skills. When we counsel people, we recommend that they accept four conditions for their first few weeks:

1. Be willing to live with a local family
2. Limit personal belongings to 20 kilos
3. Use only local public transportation
4. Expect to carry out language learning in the context of relationships that the learner is responsible to develop and maintain" (1999).

Just as this advice will help to learn a language, a huge step in understanding a culture, these steps can cross over to other cultural experiences, and are a good beginning.

4.22 A New Perspective

The ultimate goal is to develop a new cultural perspective. This is necessary for two very important reasons: to aide in building a relationship with the people, and to prevent culturally damaging actions. "We missionaries have sometimes acted in a culture-destroying manner. Whether through misinterpreting the Great Commission, pride, culture shock, or simple inability to comprehend the values of others, we needlessly opposed customs we did not understand" (Richardson, 1999). Though Richardson was speaking about missionaries, the same warning applies to designers; they must aide in the preservation of a culture while merging the ideas of an outside influence to improve the people's way of life, and not accelerate its extinction. Missionary author ,

David Hesselgrave, in his book Communicating Christ Cross-Culturally, agrees, "The gap between our technological advances and our communication skills is one of the most challenging aspects of modern civilization" (Hesselgrave, 1999).

It is not just individuals who wreck cultures, but entire groups of people. "Technology is leveling the tropics, immobilizing the nomads, dispossessing the weak, deculturizing the alien, and decimating the primitive. Tribes fall prey to epidemics, economic exploitation, modern weaponry and nationalism" (Winter, 1977). If the design missionary is to truly help, and not destroy a culture, it must become sensitive to the differences between the culture's good and self-damaging points. Richardson continues to discuss cases where missionaries had a positive influence on the people: "In both cases, the missionaries introduced culture change, but it was not arbitrary nor was it imposed by force. The missionaries brought only changes required for New Testament ethics and for the survival of the people" (Richardson, 1999).

The potential for culturally damaging effects on the people is too great to ignore. Hiebert suggests that people entering into another culture must overcome three major issues: misunderstandings, ethnocentrism and prejudgments. The three build on each other, creating higher and higher barriers to interacting with a culture. Hiebert explains the first problem this way:

> "Misunderstandings are based on ignorance of the beliefs, feelings and values of another culture. The solution is to learn how the other culture works. Our first task in entering a new culture is to be a student of its ways. When ever a culture makes no sense to us, we must assume that the problem is ours, because the people's behavior makes sense to them" (1976).

This misunderstanding through misinformation can be deadly to a relationship. The person entering into someone else's culture must bear the responsibility for developing their own relationships. It must be remembered that the society does not feel it requires anything unsolicited from an outsider.

"When we first encounter other cultures, we find it hard to see the world through other cultural eyes. We are ethnocentric" (Hiebert, 1976). The problem involves our preset tendencies and assumptions. Because of the original problems of confusion and misunderstandings, a person does not have the proper information to fill in any gaps they perceive are in a culture's reasoning and therefore use their personal beliefs and preconceived solutions. Approval or disapproval is then determined by the observer; often concluding that their own culture is superior, and that other people are less civilized. "The solution to ethnocentrism is empathy. We need to appreciate other cultures and their ways" (Hiebert, 1976). It seems simple, but this solution requires cognitive effort.

Once a person has entered a culture without establishing a good relationship with the people, and their ethnocentrism has not been quenched, it is only logical that prejudgments will be made. "On the evaluative level we tend to judge another culture too quickly, before we learn to understand and appreciate them. Our initial assessment is often that they are somehow inferior and ignorant" (Hiebert, 1976). Though these fears are unfounded, there is a cycle of misinformation that is hard to correct once it has begun. We need to understand and appreciate other cultures before we judge them.

"When we enter new cultures… we become keenly aware of the fact that other people live differently. People in different cultures do not live in the same world with

different labels attached to it, but in radically different worlds" (Hiebert, 1976). It is this realization that will help designers and missionaries view the cultures into which they find themselves. They must observe the culture and learn its intricacies. "Most people begin learning a culture by observing the behavior of the people and looking for patterns in their behavior" (Hiebert, 1976). Hiebert restates his point about cultures: "All cultures have ways to enforce their rules, such as gossip, ostracism, and force, but not all violators are punished" (1976). Hiebert is encouraging the missionary, in this case, to learn these cultural "rules" in order to understand and survive in the culture; and, more importantly, to gain acceptance by the culture.

4.3 Design Missiology in Culture

"Culture does not *do* anything. Culture is like the script an actor follows. The script provides guidelines within which actors ordinarily operate, though they may choose on occasion to modify the script, either because they have forgotten something or because someone else changed things" (Kraft, 1998). The industrial designer's perspective, once modified, can help a culture mature into its next generation. Culture cannot remain static or it will endanger its own existence.

Looking in from the outside, cultures may appear to act autonomously, and may give the perception that they do not like change. For example, people may have assumed that the Soviet Union, during the 1970's and 80's did not want change; mainly because the political figureheads told the outside world that they were well developed and prospering. It was not until after the removal of the Communist Party from dictatorial power that the true inner decay of the Soviet Union's entire system began to be seen. All cultures are still made up of individuals and not a particular form of established

government; and it should not be assumed by anyone, unless they are completely familiar with the culture, that they know what a culture needs or wants. Unfortunately, Richardson elaborates on an opposing mentality which still exists:

> "Some scientists hold to an old school of anthropology, still current in some areas, which favors isolating primitive tribes from all change in zoo-like reserves. A new school, now rising in America, has at last recognized the futility of this approach, and advocates instead that primitive tribes be exposed to survival-related 'directed change,' in order that they may learn to cope with encroachment, now seen as inevitable" (Richardson, 1999)

If industrial designers and missionaries are going to work together, then it is logical that they will form a new field in "design missions." These design missionaries must have both the skills necessary to create using design methodology and have the necessary foundations in evangelism and cultural integration. Until all these skills are integrated, however, the "design missionary" is only an idea. The implication for current industrial designers is that they must develop their skills in cultural awareness to become effective in aiding third world unreached people groups.

4.4 The State of World Need

The physical needs of third world people groups in general are economic, nutritional, water, and safety, to name a few. These issues are far greater than any group one or country can handle. Evangelical Protestant organizations, like the World Relief Corporation (an arm of the National Association of Evangelicals), seek out to help those all around the world who are in need. This help is founded on the teachings of the Bible, as taught in Matthew 25:40: "The King will reply, 'I tell you the truth, whatever you did for one of the least of these brothers of mine, you did for me'" (1998).

Three quarters of a billion people are chronically undernourished, and 55% of deaths of children under the age of five are attributed to malnutrition (World Relief Corp. [WRC], 1998). "Poverty involves several different aspects- "unbalanced distribution of wealth, climatic limitations, greed, lack of work ethic, overpopulation, political maneuvering, technological inadequacy, unemployment. No one factor can be effectively treated in isolation. All must be dealt with" (WRC, 1998). Thankfully, "since 1970 both the percentage and the actual number of hungry people have fallen significantly in developing countries" Those most responsible for distribution of food and wealth are the developed countries. "Industrialized countries include only 20% of the world population but consume 80% of the food resources" (WRC, 1998).
(See Appendix A)

The problem of clean water continues to be a separate, yet highly important issue. Water, with the exception of oxygen, is the most important resource on the planet, because our bodies require water more than anything else. It also is the most important necessity for crops and livestock. "And yet, 1.1 billion people [roughly 1/6 of the world's population] in our world lack access to clean water" (WRC, 1998). The availability of water is not the only issue, but also the quality of the water. "Contaminated water is the principle agent in transmitting typhoid, cholera, and bacillary dysentery, prevalent diseases in developing countries" (WRC, 1998). Ironically, it is through ignorance that most drinking water is contaminated; human and animal waste, as well as using the same water to wash, drink, and bathe.

Oppression or lack of protection causes many people throughout the world to live in fear. The world is scattered with refugees who have been displaced from their homes.

"In general, tribal groups are refugees, living in perpetual fear of aggression from other tribes or more powerful civilizations. Often they are able to survive by finding out how to live where no one else would want to land" (Winter, 1999). "Refugees are often in dire need" because they have been removed from everything familiar (WRC, 1998). Essentially, their culture and what skills they possess, though intangible, are the only things they have of value.

Economic deficiency, poverty, is often the underlying cause of most of the world's problems. Those most responsible for distribution of food and wealth are the developed countries. "Industrialized countries include only 20% of the world population but consume 80% of the food resources" (WRC, 1998). It is not just the developed countries who bear all of the responsibility, but also the small percentage of wealthy people within the underdeveloped countries. While the food balance is affected by the other countries, political and unemployment issues can often be attributed to wealthy national citizens.

4.5 Conclusion

A new mentality must be formed around the needs of the unreached people groups of the world. A trained industrial designer can bring his basic skills of defining a problem, research and data collection, conceptualization, refinement and testing, and communication to any people group or culture and adapt them to best aide the people. The perspective used for first world countries will not be as effective for third world peoples. With the needs of the people groups put into focus, design can redirect its processes to approach the available projects in a manner which best suits each individual culture.

This new approach must focus on culture, and the requirements it will place on this new design paradigm. If the designer, working with the Protestant mission organizations, intends on entering into a society and meeting their needs, they will have to understand the cultural laws and traditions. It is only through this cultural filter that the designer will properly identify the problems which exist, and how they may be solved.

5.0 THE PROPOSAL

5.1 Problem Statement

The issue brought before Industrial Designers is how people in third world countries will be aided by design. Industrial design is such a professional field. The design process all industrial designers use to develop new products and systems is a flexible method, but the mentality of the designer is not adaptable enough to be placed directly into a third world scenario without any modification. The industrial design community needs a set of guidelines which will help designers create an efficient advantage to utilizing design in third world countries. The reason the current perspective of the industrial designer is incapable of working in a third world scenario is the difference between first and third world cultures. A culture within any society carries with it its own set of rules and laws. The communication between two cultures can cause barriers that are not easily crossed.

People groups in third world countries cannot often improve their economic situation to current international standards on their own. Without aide, these people groups will lose their ability to remain an independent, unique community, and instead be assimilated into other cultures. It is already the goal of evangelical Christian mission agencies located throughout the world to aide these people groups in hopes to improve their lives physically, emotionally, and spiritually. These agencies have established and proven systems for working with and assimilating into third world cultures.

Industrial designers can help resolve these economic dilemmas if they are able to work within these agencies to determine the base problems of the groups. The development of a list of guidelines to prepare an industrial designer to enter into a culture and interact with a third world people group would dramatically improve their ability to aide these people groups, and to create solutions that will improve their lives. Specifically, culture-based furniture design can help to strengthen a culture's identity, and to improve the skills of the people to help them economically.

5.2 Objectives

- To modify the established first world design mentality to work within third world people groups.
- To aide third world communities in adapting to first world influences and culture.
- To recognize the utility of industrial design in specialized mission opportunities.
- To develop furniture that will preserve and emphasize a culture.
- To teach designers how to interact with third world people groups and become design missionaries.
- To establish the means to teach the people how to continue the furniture design projects after the design missionary has removed themselves from the situation.
- To redefine the role of the industrial designer with a new perspective of the international community.

5.3 Scope and Limits

5.31 Scope

This thesis is concerned with the potential for interaction between industrial designers and international mission agencies with third world unreached people groups. It will discuss the need for cultural awareness and preservation. The areas in which the present industrial design mentality does not, or cannot, accomplish this will be brought out through research of the existing design process, and the discussion of how mission agencies do accomplish interaction with third world people groups. Research will consist of Internet and literature review, as well as interviews with people who work with evangelical mission agencies that help aide third world countries.

The paper will concern all third world people groups who are considered "unreached." Their classification is given by the absence of a strong Christian evangelical influence within their own culture. The study will explore how furniture design has an impact on the culture of these people groups. The strength of this connection will develop the basis for using furniture design as an avenue for aiding people groups in economic and cultural danger. The research will include a project which exemplifies the use of furniture design in third world scenarios, and the potential for improving the quality of life for people groups within the environment.

5.32 Limitations

The scope of this paper is regulated mostly by location. The initial research for the project was conducted on location in Nairobi, Kenya at the Good Samaritan Orphanage. The rest of the project and research, however, was completed in Auburn, AL at Auburn University. The potential limitation is the difficulty of return to the location.

Upon the completion of the project, there will be no efficient way of seeing the solutions implemented.

Another great limitation is its brevity of the subject matter. Though attempts have been made to thoroughly research and address every issue as it has arisen, but because of the enormity of the subject matter, there are areas where research will have to be left for a more specific study. With this knowledge, three major subjects were the focus: the design process as it relates to third world cultures, the potential use of industrial designers in mission agencies, and the benefits of furniture design for a culture. Because this subject has not been discussed in this way previously, the approach of the research was entirely new and unprecedented.

The research was limited within the confines of mission and humanitarian efforts of the Protestant Church. It is recognized, however, that the Holy Roman Catholic Church, as well as many secular organizations, offers very positive aide throughout the world. The findings of this paper could easily be used within these other groups with little or no adaptation; such an interaction would be highly encouraged.

5.4 Need for Study

Designers, by definition, seek to improve peoples' way of living. The designer solves problems and creates solutions in order to aide the masses with the issues that they may, or may not, realize occur in their everyday lives. A compelling reason for design in third world countries is the advancement of technology and first world influence. Though a culture may desire to remain autonomous, the rapid influence of outsiders in this modern world could quickly destroy it. It is the responsibility of affluent first world nations to actively seek to aide people groups who seek help after being influenced by an

outside culture. Design can explore, capture, and embellish a culture with the development of products and systems that are able to preserve and even promote the existence of a people group.

There are, conservatively, about 12,000 ethno linguistic groups in the world, and the evangelical Protestant Church desires to see that every individual group has the opportunity to hear and understand the Gospel of Christ (Johnstone, 2001). Those groups of 100,000+ who have never heard the Gospel, called "unreached" people groups, run about 650. The international mission agencies who work toward the goal of evangelizing every unreached people group have an enormous task. With the shift in world mission strategy to "specialized" agencies, the opportunity for industrial designers to participate has become available and is encouraged. Industrial designers are equipped with unique problem-solving skills that can benefit third world people groups as much as they do affluent first world groups.

With poverty so prevalent in third world people groups, the need for economic aide is a major priority. This is because many other issues are derived from poverty. If a missionary simply met this need by offering financial support, there is no guarantee that this gift would last. A more helpful solution is to work with the people group and develop a product which can be turned over to the people to take as their own; thus, creating a source of income. This product should help meet the needs a people group has for economic and cultural stability.

It is here that industrial designers can begin to offer their talents and skills in order to improve the lives and economies of these unreached third world people groups. This thesis proposes a method and solution to this ever-present issue. Designers need

new thought paradigms when entering into such cultures to help give them a starting reference. So often a designer already has a methodology for design, but this is within an understood culture, with good communication as to what that culture's needs are. This thesis will spell out how to go about gaining a cultural perspective to interact with the culture of an unreached people group or community, and offer culturally specific furniture design solutions as a way to improve the peoples' general way of life.

5.5 Assumptions

The greatest assumption made in this study is that the people groups need the help of the designer. This assumption deals with the possibility that a people group are willing to move into a more modern system. The danger with this assumption is actually cultural. As pointed out by Leslie Speer, professor of cultural design at the California College of Arts and Crafts, "Cultural formalities may not allow the people to contradict their guests by refusing help, even when they do not desire the gift offered" (2005). Western aide is often surrounded by a zeal which blinds those helpers from truly understanding the needs of the people. If a design missionary forces aide upon someone, then more damage than good may occur.

This study also makes an assumption that furniture will be a good economic benefit for the people group they are helping. Even if the need is not furniture, the designer can offer assistance with this same model. The scope of this study will simply not accommodate every possible scenario.

The final major assumption in this study is that it is unique. During the research of the many related topics, no identical study was discovered. There were, however, several very similar scenarios; Leslie Speer with her experiences with Mexican artisans,

and with John Lyman of Indigenous Accents who sells native pottery to first world markets are two examples of organizations that are dedicated to the advancement of willing third world people groups. Both were interviewed to gain a perspective from business and design as to work that is already being accomplished.

The philosophy behind this thesis is that the average designer does not design for anything beyond a marketing department or a client. The study makes the assumption that too many designers are simply in the profession "for the money"; that their view of design is to improve aesthetics only. Designers, by principle, should use their skills and talents for the greater good of this world. The design profession is too undefined to assume that this paper will appropriately rate good or real design, but it will attempt to create, or further define, an area in which the designer can flourish.

"Whatever you did not do for one of the least of these, you did not do for me." (1998). This quote from Matthew 25:45 in the Bible sums up the purpose of this study. How can a person of well-established means (someone who is blessed) help those who are less fortunate? This perspective is meant to be adaptable to many different scenarios; basically to wherever the people are. Ultimately the goal is to promote this new thought process throughout the evangelical mission agencies and industrial design field all around the world.

5.6 Anticipated Outcomes

This paper will establish set guidelines that will aide the assimilation designer's into the cultures of third world unreached people groups. It will take into consideration all data available for a selected group, with particular attention to any resources that could be used in furniture production. With the gathered information, and the formula

developed within this thesis, a designer will have the necessary tools to develop a relationship with a culture to understand it more and offer better design solutions (i.e. - products) that will aide the selected people group economically. Whenever possible, the designer will also be encouraged to use the necessary means to promote and distribute the products of the chosen people group in order to finish the task of improving the group's economic well-being. Ultimately, the goal of this study is to provide an avenue to create trusting relationships in order to have the opportunity to present the Biblical Gospel to every people group and culture.

The sample group for this project was studied, and time was spent in their environment to better understand their particular needs. A relationship had previously been developed with the children of the Good Samaritan Orphanage, and their specific needs were analyzed. Once their needs are clearly defined, a problem statement was created to develop a piece of furniture that directly met the children's needs. From the proposed solutions, one was selected as a test project. Finally, an established market or venue will be selected where the product can be distributed in a manner that will be most profitable for the group.

The full scope of this study cannot yet be fully determined. The desire is to encourage designers to use their skills to help those who are not economically stable. With this aide, the potential for a greater range of products with a greater range of influences can be created for the improvement of everyone.

5.7 Methods and Procedures

The new cultural design process will not take away from the first world design process; rather, it will complement and add to what exists. The first step will be to

analyze the information given about the original design process and to break down the necessary elements. Next, the methods and procedures of Protestant mission agencies will be reviewed in order to understand how the industrial designer can replicate their steps within the new cultural design process. The purpose behind focusing specifically on furniture design will also be explored.

After the initial research is compiled, a review of the initial design process will reveal what is lacking in order to adapt the process to other cultures. In regards to the new cultural design process, those steps which are considered to be necessary will be determined and placed within their appropriate design phase. The necessary steps will also need to be taken before and after the standard three phases and two new phases will be added at the beginning and the end of the new process. Ultimately, the new cultural design process will be longer and more detailed. Once the new phases and steps are listed, the deliverables will be determined for the final project.

6.0 CULTURAL DESIGN PROCESS

6.1 The Phases of Third World Design

For Industrial Design to work in a third world setting the designer's mentality must change, and therefore the design process must be modified and reprioritized. The elements of the design process for a first world country are: (1) definition of the problem, (2) research and data collection, (3) conceptualization, (4) refinement and testing, (5) communication. These steps occur during three phases: Research, Development, and Communication. Even though these steps will differ from one design project to another, the differences between two completely different economic and cultural backgrounds are such that one model would be inadequate for both types of design.

In order to work with a third world culture, the design process should be broken into four or five phases: Integration, Research, Development, Education and Communication, and Follow-Through. Beyond these new phases, there are also some key steps within these phases that are highlighted as important in working with other cultures.

6.2 The Integration Phase

The Integration Phase is the most unique phase of this new cultural design process. This is because when a designer, educated in one culture, designs a product or system, many of the assumptions made by that designer can be tested in the research

phase. There is no need for a designer to relearn their own basic culture. Ironically, the Integration Phase is a period of "non-design." The design missionary should not design for a culture they do not understand, and they should not even assume that their help will be appreciated until that understanding and open communication has occurred.

The Integration Phase has five key steps that must be addressed during its allotted time: identify receptive areas, find a helper, earn the people's trust, learn to communicate, and a period of assessment. These five steps are the non-design assimilation that must occur. Before a designer can offer assistance to any client, they must gather as much information as possible. If they do not have an adequate cultural filter, however, neither the designer nor their designs will be able to address the true needs of the client.

6.21 Identifying Receptive Areas

The need for this step is two-fold. First the design missionary should find those areas that appear to have a desire for interaction with an outsider. There are those cultures as a whole that may prefer not to have outside influences. Whether a people group chooses to remain isolated or not is its own prerogative. An ethical dilemma still may arise if no welcome seems to be offered. The solution is the knowledge that outside influences will enter into every culture, and it is the goal of the design missionary to help the people cope with it.

The second reason for identifying receptive areas is to allow those groups who want interaction to receive the help they desire. The goal of the design missionary is not just to meet physical needs, but social and spiritual needs too. The benefit to helping receptive areas is it gains validity to the designer's cause. After aide has been given to a

receptive group, the designer now has clout with more skeptical groups, as well as the endorsement of those they have helped.

6.22 Finding a Helper

The design missionary will need help in communicating with the culture they are trying to help. The main obstacle is often a language barrier, which requires time to overcome. The design missionary must seek out an individual who is willing to help them learn the language, and who is willing to help them further assimilate into the new culture. The designer will need lodging as well, and it can be found with the aide of the helper.

The relationship must be maintained by the designer; if the designer wants to truly learn the culture, they must put forth more effort than those they ask to help them. It is natural for all people to desire human interaction, but it is the lone designer who must make the effort to join the group. The relationship will be strengthened as the designer learns more about the culture. The helper is a liaison between the design missionary and the people group, and is an invaluable resource. Often, this individual is referred to within mission agencies as a "person of peace," and identifying that person is very important in reaching into a culture.

6.23 Earning a People's Trust

The interaction with a people group can only progress to a business or "marketplace" level without trust. As the designer seeks to gain the people's trust, they must not have an agenda. The interaction between the two must be through the efforts of the designer, but dictated by the culture. The design missionary should not be "designing" during this time, but instead, they should be observing and learning. The

communication barrier will never be broken until the outside designer is accepted into the culture. This barrier can only be overcome by time spent interacting with the people. Without trust, the design missionary will not be allowed to explore and research the reasoning behind the culture, and therefore use the culture as a basis for their designs.

6.24 Learning to Communicate

The most obvious form of communication barrier is linguistics. The designer often overcomes this by using other forms of communication such as drawing and model-making. The designer, then, should realize that communication involves many facets, some not even sensory.

The design missionary must be able to know customs, traditions and expressions within a culture and their meanings. Most conflicts begin with miscommunication, and with new relationships this issue can be critical. The need for good communication emphasizes the need for a helper that can translate and teach the missionary, and encourages spending as much time with the people group as possible.

6.25 Gaining a Cultural Perspective

The ultimate goal of the Integration Phase is to gain a cultural perspective. This perspective occurs when ethnocentrism is totally removed, and the design missionary can observe a culture from within. The design missionary must be assimilated into the people group, and they must have a strong understanding of the culture's traditions and standards morally, spiritually, economically, and personally. The Integration Phase should not be limited by time whenever possible. The designer must know that they have a good cultural perspective, and that all the key steps have been addressed fully, before attempting to continue.

It should be recognized, however, that once a culture perspective is learned, the timeline for projects becomes shorter. In the case where a non-design missionary has already established a relationship and learned the culture, a design missionary has the option of using a design project to strengthen the relationships of the first missionary. The timeline becomes shorter, but the Integration Phase is not removed immediately. The only time an Integration Phase will be removed is after an adequate amount of time has been available for a design missionary to become fully assimilated, and they intend on staying with the people group on a long-term basis (more than five years).

6.26 Sharing the Designer's Culture

One big step toward learning one culture is to share your own. The designer will, by default, act as an ambassador of their own culture. The people group they will be working with will want to know the designer's original culture and understand the designer's motivation for entering into their society.

This provides for a unique opportunity for the designer to begin helping the people group spiritually. A study of the Holy Bible will provide an avenue for the designer to share their own religious background and the basis for many of their beliefs. The studying of the Bible is so beneficial toward the understanding of the Gospel. This is because of the teachings found in Isaiah 55:11, "so is my word that goes out from my mouth: It will not return to me empty, but will accomplish what I desire and achieve the purpose for which I sent it" (1998). The design missionary will begin a foundation which will give the people a reference in the final Follow-Through Phase when the Gospel is shared.

6.3 The Research Phase

This Integration Phase by no means denies the work accomplished within the typical Research Phase. It may well be argued that no matter how well an individual knows a culture, there is a necessary amount of research required for a designer to know their client's and user's specific needs. This is true, but the Research Phase is not the time to completely learn a new culture. A culture should already be understood before the true research begins.

The Research Phase within this revised design process has little modification. Research will have to consist of the basic functions of: marketing and general business, production issues, human factors, and any technical needs that must be addressed. The differences occur in the emphasis of the research. In order to aide a culture economically, a designer may have to define, or even create, a market for the furniture; thus emphasizing the function of business, particularly marketing, in design. The designer may know of existing technology or resources elsewhere, but must avoid relying on anything not immediately available. The main reasons are the cost and time involved, and the diminishing margin of returns. Another reason for not bringing in outside resources is to maintain the integrity of the product. If the furniture pieces developed are intended to emphasize and utilize a culture, then they should be produced completely within that culture. The designer should spend as much time learning the local methods of production as he or she spends researching the problem.

Research will also have to emphasize quality control. The designer must understand the production methods of the people group and locate any areas that may lead to inferior-quality results. As a liaison to an outside market, the designer must also

be able to ensure the highest quality of product to the user. An entire project need not be managed solely by the designer; no designer works alone, and finding outside assistance for logistics, distribution, and many other support issues will need to occur during the Research Phase.

6.4 The Development Phase

The Development Phase is essentially the very same for any design process. The conceptualizing, refinement, and 3D development are all necessary in any design project. As has already been asserted, the steps and order are entirely up to the designer and the situation. The determining factors for which steps to follow, and in what order, will be dictated by the new cultural perspective which the design missionary has learned. It will be necessary to work closely with the people throughout this phase so that the proposed solutions will not be so misunderstood that they are rejected. The final decision still rests with the clients, which are the people group. If a design missionary wants to eventually turn this project over to others, and has introduced new ideas, then they must keep the relationship between them open with good communication.

6.5 The Communication/ Education Phase

The Communication Phase of the third world design process involves as much education as communication. In addition to keeping the people fully abreast of the design process as it is happening, the design missionary must explain the final solution(s) to the people in such a way that they can take ownership of the project. The people must understand the project well enough to be able to repeat the process and to modify it when necessary.

The role of the design missionary will become that of educator as well. The people may need to be educated in preliminary business theory. The workers will need to understand the business culture of the first world in order for their furniture to succeed in the marketplace. Before business theory, the workers may need to learn a new production process in building their new pieces of furniture. The necessity of knowing as much about the furniture design and production field as possible is part of the knowledge a design missionary must bring with them.

The ultimate goal of the design missionary is not to become an authority over a people group. The projects that are developed into real furniture are to give the people control of a commodity that can improve their lives. The projects must therefore be turned over to the people to become responsible for. Even if the design missionary intends on staying with the people, they will only act as a consultant after the project has been turned over. This allows the people to reap all of the benefits from this new product and to have ownership in what they do.

6.6 The Follow-Through Phase

The Follow-Through Phase is added to the cultural design process to help the design missionary complete the goal they seek to accomplish. It allows the designer to finish the task of designing a piece of furniture and continue to aide a culture in the other areas of their need. The authority of the design missionary is only that which the people group gives them. The designer should never overstay their welcome, nor should they consider their knowledge superior. This was emphasized in the Integration Phase, and it is acted out in the Follow-Through Phase. There are more options within this step

because of the direction the project will need to take after the final solution has gone into production.

6.61 The Market and Logistics

A third world country is not always the best market for furniture. Though every person, no matter what their status, utilizes furniture, profit follows the consumer. Once the designer has helped the people create a product that is market ready, they must also help find that market. There is a possibility that the market is close to home. The furniture may be used within the culture, but more likely a more profitable market can be found outside the culture. During the Research Phase the designer should have located a potential market, or markets, in order to define the user and performance criteria of the project.

The design missionary may even have to consider the logistics of how the furniture will be transported and sold, when and where, and develop price points and production schedules. The designer is not expected to complete all of these tasks alone, because no designer is autonomous; the emphasis of the business aspect will simply be greater. Though the market has already been defined and identified in the Research Phase, the task in the Follow-Through Phase is for the designer to aide in bringing the producer to that market. This may mean coordinating to actually move the furniture, or to simply find a seller or buyer who will work directly with the producers.

6.62 Meeting Further Needs

Turning the project completely over after production has begun frees up the resources of the designer to continue developing new projects, to assist in the spiritual development of the people by sharing with them the Biblical Gospel, and possibly to

move to another people group to offer them the same type of aide. The education of the local culture has one final benefit, and that is for the people themselves to go out and help others by using the same process. The goal to meet as many physical and emotion needs as possible is to gain the opportunity by the design missionary to meet the spiritual needs of the people group. By meeting this need, the design missionary can offer the people hope and love. With these encouraging assets, the people will live fulfilled lives, thus completing the design missionary's task.

6.63 Follow-up/ Staying with the People

As mentioned before, the design missionary may choose to finish a project and then move to another people group, or he/she may see a benefit in staying with the same people group. Whatever the decision, it should be based on the further needs of the people. No matter what the decision, however, the design missionary should continue their relationship with the people group. In the event the relationship is severed the people group may feel cast aside and revert back to their former lifestyle. Also, if questions occur concerning the designer's process or solutions, then the designer must be available to answer them.

6.7 Why Furniture?

For the purposes of focusing this thesis into a manageable time period, furniture design was chosen as a medium. The application of this third world design process could easily be adapted to another type of product or system, and still fit within its parameters. By choosing furniture the study is emphasizing the need for the design missionary to know as much about the processes of what they are designing as possible. This is true for

any type of design, but especially important when the designer will be educating others on the subject, and in an environment outside the designer's own culture.

Furniture is developed through culture. The basic necessity for furniture is based on the everyday actions of the people. When furniture is designed outside the normal paradigms of a culture it either redefines itself, or it fails in the market. Furniture production processes can often encourage cultural techniques and traditions, thus strengthening the foundations of the culture. It is not only the product the design missionary is trying to develop, but the people as well.

6.8 Deliverables

The newly modified design process for unreached third world people groups can easily be adapted to any unknown culture. As a resource for the designer seeking to change their mentality about design, a diagram of the five phases is pictured.

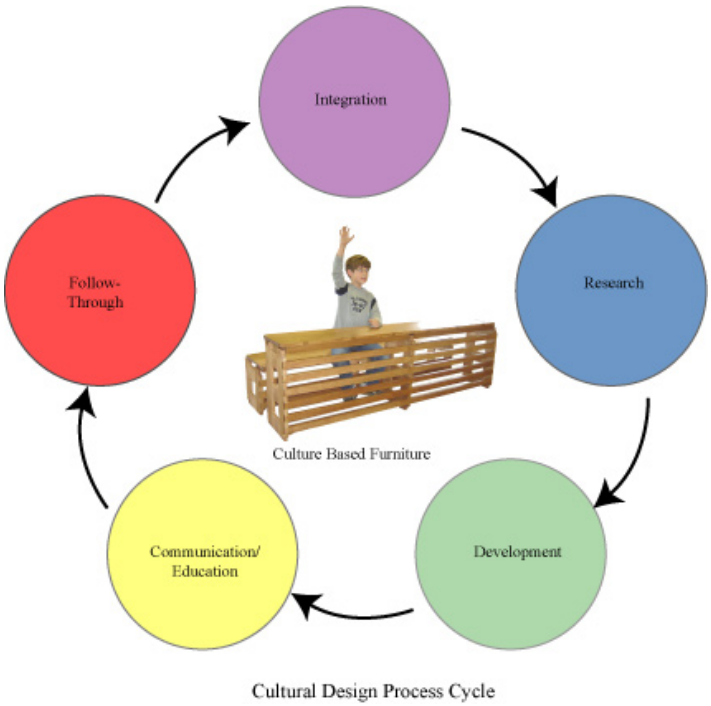


Figure 5

Along with the diagram, a sample Gantt chart as been provided in the Appendix (see Appendix B). These may be used as quick references while on the mission field. They can act as checklists to ensure that the necessary foundation has been laid to successfully aide a people group. As a matter of application a sample project scenario has also been conducted.

6.9 Conclusion

The first world design process is an adequate system for designers within that environment. It fails, however, to help a designer change their mindset to enter an unknown culture, especially one in the third world. Through the aide of evangelical mission agencies, this paper utilizes the methods of these agencies to develop a revised system for those designers who choose to work in third world cultures. Within these cultures are more than just physical needs however. This thesis is focused on those third world groups with physical, emotional, and spiritual deficits, referred to as unreached people groups. The goal of the system is to prepare the design missionary to use design, specifically furniture design, as an opening to meet all of these needs within a people group. The proposed changes are shown in the figure below.

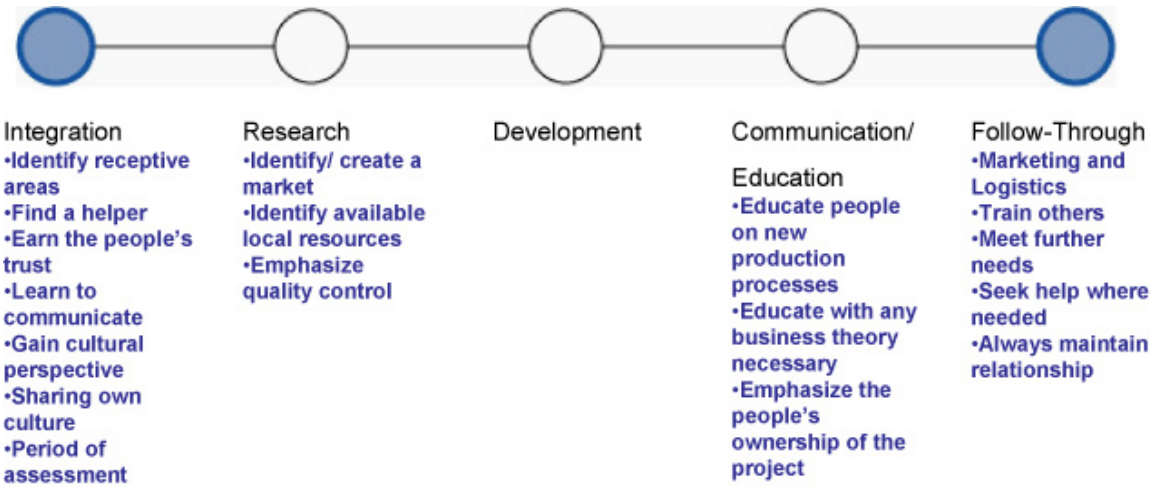

Integration
•Identify receptive areas
•Find a helper
•Earn the people's trust
•Learn to communicate
•Gain cultural perspective
•Sharing own culture
•Period of assessment
Research
•Identify/ create a market
•Identify available local resources
•Emphasize quality control
Development
Communication/
Education
•Educate people on new production processes
•Educate with any business theory necessary
•Emphasize the people's ownership of the project
Follow-Through
•Marketing and Logistics
•Train others
•Meet further needs
•Seek help where needed
•Always maintain relationship

Figure 6

7.0 APPLICATION

To illustrate this study a sample project was conducted with the Good Samaritan Orphanage in the slums of Nairobi, Kenya. Because the timeline was too short for a personal relationship to be developed with the orphanage, the relationship that already existed between them and missionary Doctor Michael Johnson was used. Doctor Johnson has worked with this particular orphanage for several years, and returns at least twice a year to conduct medical clinics to ensure the children's health. His relationship with the orphanage is very strong. Doctor Johnson has learned the common East African language of Swahili in order to communicate with his patients directly. He earns surgery benefits by working at the hospitals in the city, and this allows him to offer advanced medical services for free to those who cannot afford it. This project was developed to strengthen his relationship with the Good Samaritan Orphanage. The project also offers the orphanage a design solution to meet their physical needs, and is intended to increase the skills of the workers in the woodshop to improve their craftsmanship.

7.1 Researching the People Group

Kenya's culture could be considered a combination of traditional tribal culture and British (Western) influence. Though the country has many modern amenities, the untamed elements of its natural habitat are also very prevalent. The country is comprised of nearly 70 tribal groups. Some of the more noted tribes in Kenya are the Kikuyu, Bantu, and Masaii. While many of the tribes have assimilated into some parts of Western

culture, some nomadic tribes (like the Masaii) have remained relatively the same for hundreds of years. Though the lines between tribes have become less distinct, the most polite question to ask a Kenyan is, "What tribe are you from?" The official language of Kenya is English, but many tribal groups continue to speak their own dialect, as well as the generic tribal tongue of Swahili. Because parents may come from different tribes and rear their children in still another tribe, a child could easily grow up speaking five or six different languages.

Though modern commerce exists in the big cities of Kenya, there are still huge open markets where tribal craftsmen peddle their wares by bargaining, instead of having a set price. Kenya continues to try to preserve the popular animals that inhabit its borders. There are reserves throughout the country that protect both the animals and their habitats. Despite the third world status, Kenya is rich in culture and history. As a developing country, it is doing its best to encourage ways to maintain their heritage and yet continue to advance toward the future.

Perhaps the only drawback to the influence of Western culture is the inability of this Third World government to provide the Kenyan population with the same opportunities a First World country can. The result is a huge portion of the population moving to the city to look for jobs that do not exist. Because of the influx of people, some of the world's largest slums have developed all around portions of Nairobi (the capital), and Kenya's other large cities. The Good Samaritan Orphanage is located within one of the many slums of Nairobi; it is literally surrounded by trash. There are around 200 children, from infants to older teenagers, who live within the walls of the 1200 square foot compound.

7.2 Further Research of the Specific Scenario

The owners of Good Samaritan focus on offering the children of the orphanage an opportunity to grow up and to have a little education. There are resources to teach the older girls the trade of sewing and tailoring, and a woodshop where the older boys build furniture for money. The younger children attend school everyday in the same rooms where the girls sleep. The needs of the orphanage were many, but by using the modified design process developed earlier in this paper a final furniture solution was created.

A group of Americans, including an industrial designer, a teacher, an accountant, and a nurse, accompanied Dr. Johnson on one of his routine semi-annual medical trips to the orphanage. The physical, social, and spiritual needs of the children were addressed with medical care, games, songs, and Bible stories. Also, observations were made as to the children's living conditions, and what resources they had available. An area that needs much attention is the sleeping arrangements of the children. The girls in particular sleep on concrete with unsanitary mattresses amongst rat infestation. A design project was defined to develop a piece of furniture that would minimize the work involved in transforming the room to suit its two different purposes, and to do it safely. The resulting piece of furniture will address these issues of overcrowding, comfort, sanitation, and durability, as well as others.

7.3 The Research

Part of the research focused on the American furniture market. Two main reasons for this were the use of the desks and the potential to teach the woodworkers in the

orphanage how to build furniture that would be desirable in the first world marketplace. The desk was researched as well as transforming/ multi-functional furniture in general.

7.31 The History of the Desk

The desk is the modern derivative of the adjustable drawing tables, or drafting tables, originating in the late 18th Century. The modern desk and ancient tables attempt the same goal, to provide the proper amount of adjustability in order to maximize the comfort and efficiency of the user when writing or doing anything that requires a flat, sturdy surface.

Desk forms may have existed in the early civilizations of the Middle and Far East, but there is little proof to support this. It wasn't until the Medieval Era that the first illustrations are found to have pieces of furniture that were expressly designed and constructed for reading and writing. Before the invention of the movable type press in the 15th Century, any reader was potentially a writer, publisher, or both; this is because any book or document had to be copied by hand. Desks were designed, consequently, with slots and hooks for bookmarks as well as writing implements. Desks were often larger because of the need for the many tools needed to copy documents.

Desks of the Renaissance and later eras had relatively slimmer structures, and more and more drawers as woodworking became more precise and cabinet making a distinct trade. It is often possible to find out if a table or other piece of furniture originating during these times was designed to be used as a desk by looking for a drawer with three small separations (one each for the ink pot, the blotter, and the powder tray) and room for pens.

The desk is a more direct evolution of a piece of furniture called a Bureau a gradin, or bureau à gradin, a form of writing table. The Bureau had several tiers of small drawers and pigeonholes built on part of the surface. Usually the drawers and pigeonholes were placed in front of the user but sometimes they would surround him, or her. Since this change, the desk has taken many forms. The ergonomic desks of recent decades is the newest addition to this long line of forms. With all the variations and changes, however, the desk still remains a simple refinement of the mechanically complex drawing table of the late 18th Century.

7.32 Desks for School

The exact history of the schoolhouse desk is quite vague, but the principle reason for its use seems to be order. Regarding early American education, the schoolhouse (often only one room) was set up for the teacher to be the dominate feature. In these early American schools, children sat on three-legged stools or long benches behind narrow tables, often hand-made of pine or oak by the parents of the schoolchildren. By the 1880s, children sat at individual desks that were bolted to the floor, with boys on one side of the room and girls on the other. Younger children sat at the front of the room, closest to the teacher. This arrangement enhanced the teacher-centered learning environment that has become popular in schools throughout American history. Students rarely faced each other and focused their attention entirely on the teacher, who was the sole source of instruction and discipline in the classroom. By 1930, portable desks were common, and were used in much the same way as the old benches and tables. A shift in pedagogy began in the 1960s when small, round tables were introduced to encourage interactivity between children. Teachers began to

take themselves away from the front of the room and the standard "chalk and talk" pedagogy. Students are now encouraged to work collaboratively, relying on each other's knowledge and skills. In this setting, the teacher's role is that of a learning facilitator. Today, both individual portable desks and round tables are found in schools across America.

The school desk occurs in two main types: the tiny chair and desk combinations made for pre-schoolers, and the larger institutional desks installed in a typical school room. The tiny chair and desk combinations usually are marketed for domestic use, as a crafts activity center for pre-literate children. This kind of desk gives them a play surface more suited for their height than most of the furniture in a normal home. The drawers and nooks partly mimic the conveniences of adult desks and are designed to hold crayons and other play materials. These school desks are often constructed of brightly colored parts of sturdy plastic, with rounded edges. These tiny school desks are made in a huge variety of forms. Some copy the style of the pedestal desk that adults use while others look like a writing table, and still others offer strange shapes.

When children grow older and taller and when their schooling requires them to do homework, they graduate to a student desk, which is better suited for serious reading and writing. A student desk can be any desk form meant for use by a student. This kind of school desk is expected to suffer extremely rough treatment over the years and is normally built accordingly. Many of the school desks which survive this treatment end up getting sold in lots at the end of a certain period, and can thus reach the antiques market. These antique school desks often end up in homes, for decorative or sentimental reasons.

Early school desks were built of wood. The transition to steel occurred during the early 20th century.

7.33 Multi-functional Desks

A mechanical desk usually refers to an antique desk type which was produced during the 18th or the 19th century. At one extreme such desks were furnished with a multitude of panels that swung out while stacks of small drawers popped up when a user lowered or extracted the main writing surface or desktop from a closed position. This was due to some well placed levers and/or gears. The other extreme was mechanically simple desks like the Wooton desk whose two panels opened up separately by hand, and whose desktop was also opened in a separate manual operation, without exploiting any gears or levers. The term “mechanical” is used quite loosely.

There was an explosion of mechanical desk designs in the second part of the 18th century. This came at the same time as a renewed interest in smaller domestic furniture in the homes of the rich, and the general introduction in their homes of all kinds of new mechanical devices such as small clocks and wood turning tools. The devices and the interest in them were a result of the technological ferment which arose in the United Kingdom during its Industrial Revolution, and gradually spread to Europe. The mechanical desk fad gradually passed away at the beginning of the 19th century. By the middle of the 19th century desk mechanisms were mostly simple affairs meant to extract or retract sliders or supports, but they had laid the groundwork for the modern transformer chair.

Transformer chairs face an array of issues that demand operating efficiency. Some transformers have two or three modes of transformation, for example:

(1) studying, reading, writing, (2) comfortable sitting for relaxation and contemplation, and (3) informal conferencing. The main categories of these transformers are: transformers you can use in two (or more) different ways without changing mode; transformers that change modes (the chair turns into...); accessories are attached to the chair (linked); and accessories in use only for one mode, can be taken apart (not linked).

7.4 Statement of Intent

The objective, and therefore the intent, of this furniture design is to create a piece of furniture for the children of the Good Samaritan Orphanage in Nairobi, Kenya. This piece will function as both a school desk and a sleeping pallet; and will convert easily and safely without the use of tools.

7.5 The Human Function

7.51 Socio-Economic

The orphanage has a woodshop that teaches the older boys a trade, and acts as a source of income for the entire group. The resulting piece of furniture will help these boys develop their personal skills as carpenters. The proposed joints and woodworking techniques that will be used may, or may not, already be used by the boys. Regardless, as any craftsman could attest to, the work will help improve what skills they already possess.

Economically, quality wood furniture can demand a high price. This would benefit the orphanage with their financial straits and give the older boys something to look forward to when they leave the safety of the orphanage. Possibly, this would be an

incentive for them to leave. Even in the immediate, short-term of the project, the orphanage will benefit by the use of the desks.

7.52 Anthropometric Data

Most anthropometric data for African children is in regard to nutrition, and almost none is available to the public. The most plausible way to collect the data needed for this project is to adjust information collected on American children proportionately for African children. This was determined through data collected from African adult male tribesman in 1968 by Friedlaender, in his book *Patterns of Human Variation* (1975). Below is a table based on his figures and information of the male American in Julius Panero's *Human Dimension and InteriorSpace* (1979).

height	arm length	sit height	chest breadth	weight	hand length	head breadth	face height
1617.11	756.67	837.67	250.56	125.5	187.72	143.67	114.89
63.6614	29.79	32.979	9.86439	SAME	7.39064	5.65617	4.52318
5%	5%	1-5%	5%	5%	5%	5%	5%

Key:

Average African adult male
conversion to English system
American adult male %

Table 1

This anthropometric data suggests that the African male is, on average, the size of 5% of America's adult male population. Though it may be a strong assumption, due to the lack of available data, it will be assumed in this project that the average African child is the same size as 5% of the American childhood population. The figures and diagrams for a 5% seven-year-old American male are displayed on the following page.

7.53 Anthropometric Analysis

In order to gain a better understanding of the user, a test model was brought in to study his interaction with the desk. A six-year-old test subject (my nephew Hunter) was asked to work at a full scale mock-up. The heights of the desk were varied in order to determine the best desk height.

The 19.5” and 22” were both considered ideal. The model felt comfortable and had good posture. The 19.5” was chosen first, but ultimately the 22” solution better fit with the overall design (it allowed for the bench to fit within the slats, and the desk to act as a backrest).

18 inches

19.5 inches

22 inches

24 inches

Figure 7

7.6 Technical Function

The best material for this desk will be the most cost effective and the most readily available type. In Kenya, forests only cover about 3-5% of the land. Despite this seemingly sparse availability, Kenya has been able to use wood as a primary resource for building and craftwork. This is due, in part, to attempts at conservation and reforestation by the Kenyan government. The Acacia tree is a thorn tree that has 40 different species within the borders of Kenya. Its wood is used most often as construction material, but it also makes fine furniture. While Acacia is a common construction material, and a good selection; there are also some other woods that will be suggested to the orphanage for use. Because the constant threat of deforestation of popular hardwoods still exists, the Kenyan government has begun to encourage the use of alternatives. Neem, jacaranda, and grevillea are all species of trees that have been identified as good substitutes for the carving industry. They are good quality and faster growing, with a minimal ecological impact. They also have the potential to bring more income to farmers who grow these types of trees. These wood types will be suggested for the orphanage because of their lower cost, and in an effort to help the general cause of conservation- hopefully educating those in the orphanage as well as those around them. Because all of these exotic African woods are essentially unavailable for this project, a domestic soft maple was chosen to build the final model. The final model was stained cherry and oiled in order to give the wood an appropriate appearance similar to that of its African counterparts.

7.7 Production Function

7.71 Description of current woodshop

The workshop at Good Samaritan Orphanage is only about 300 square feet, though it houses all of the tools, materials, and most of about 20 teenage boy workers. The shop produces about 2-3 pieces of furniture a day; often a chair to be upholstered or a bed frame. Because there is no electricity, the furniture is made only with old hand-tools. The craftsmanship is crude, but the style seems typical. Chair arms and head and foot-boards, are railed with large spindles. The finished product is only lightly sanded before it is stained. The stain is often red, and is simply painted on and allowed to dry in the sun. Their finished product does not seem bad, but is very rough and lacks refinement or care.

7.72 Construction Methods

For this project joints were determined based on strength and function. The hinge-bars for the tops are attached with dovetails to match those used on the slats. The rest of the frames are held together with mortise-and-tenon joints. The desktop and bench top are 12 inch planks, and are held onto the frames by simple dowels. The bench and desk can be held together with short pegs through predrilled holes. The pegs also hold together the bed pallet for safety. The distance of the slats was determined through testing. A sample was built to study for safety and comfort. The final distance between the slats, which were turned flat for the bed, was set at one and a half inches.

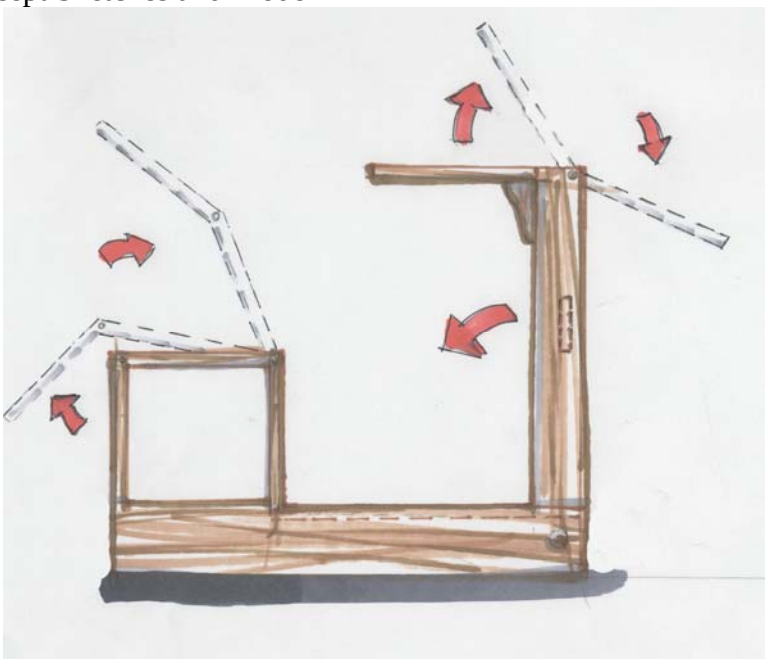
7.8 Performance Criteria

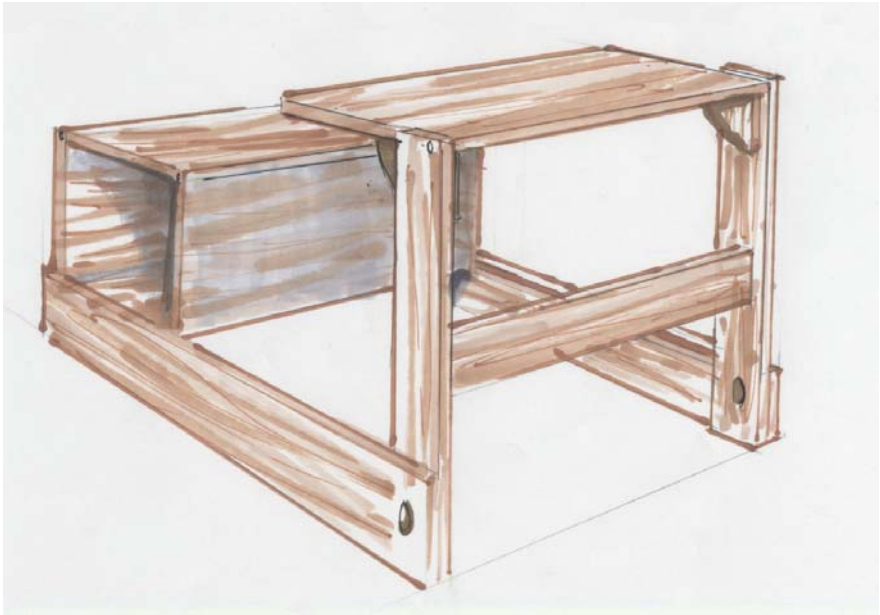
1. hold at least five seven-year-old children (width) on bench
2. convert to pallet

3. have cushion on pallet side if at all possible, at least a pillow
4. not fall apart when moved as a desk
5. able to be handmade, no power-tools at all
6. Anthropometrically/Ergonomically ideal in the given restrictions:
    a. Size of rooms
    b. Number of children in each room
        i. Number in room for class
        ii. Number in room to sleep

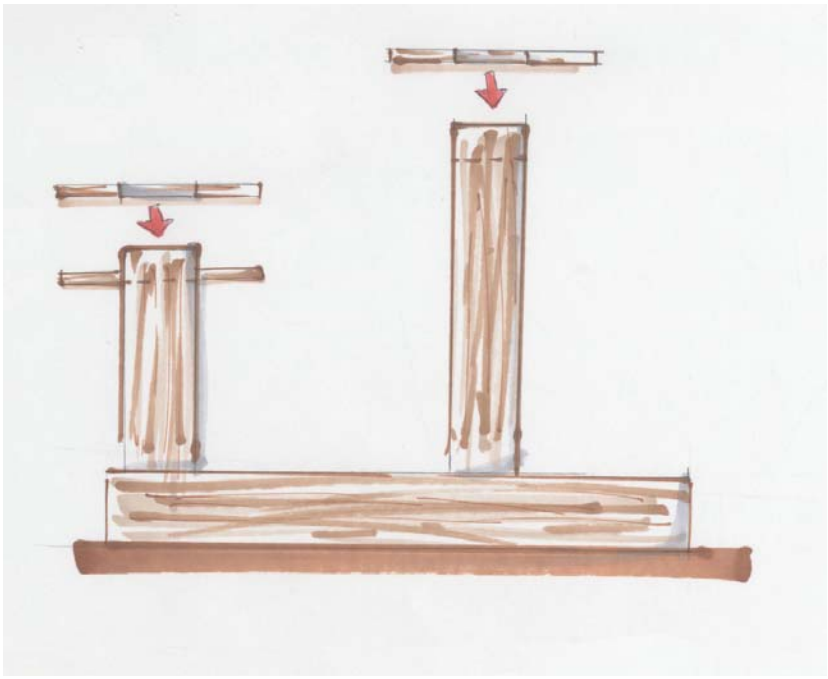
7.9 Concepts- Sketches and Models

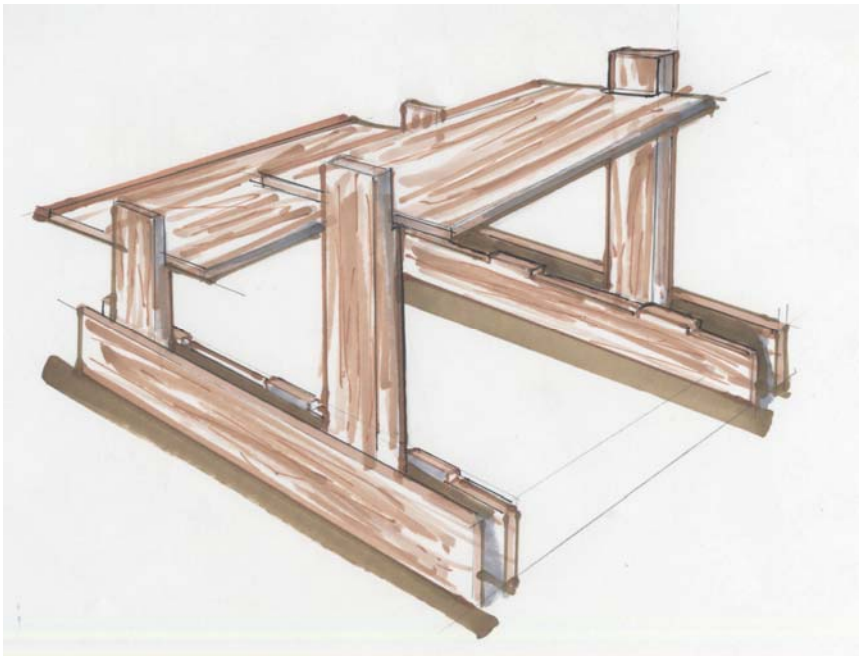
7.91 Week 1- Concept Sketches and Model



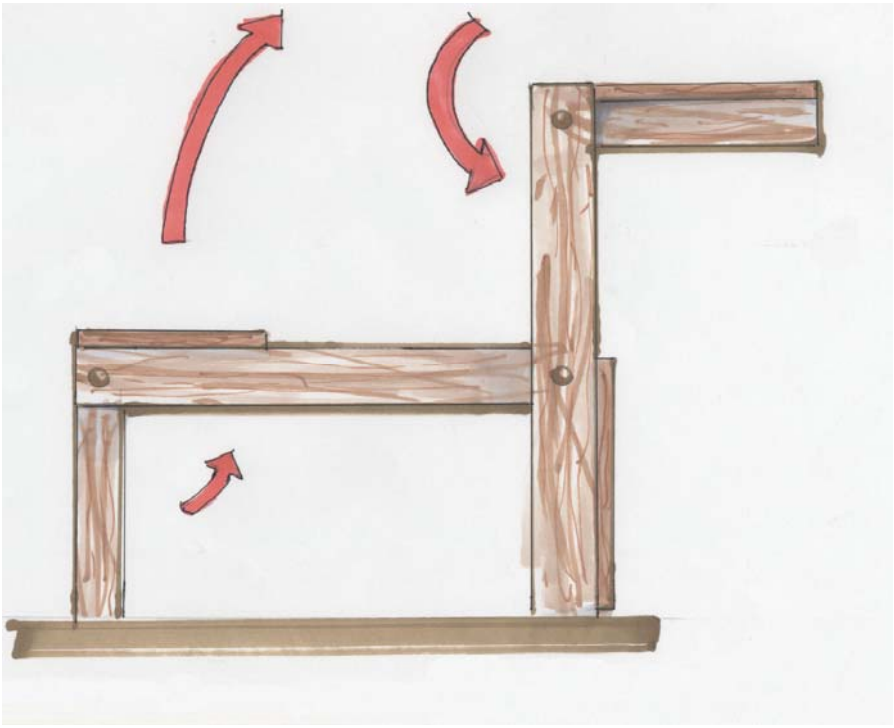


Concept A- This first concept is a one-piece unit that folds down to become a pallet. It shows the two largest issues I dealt with while conceptualizing my desk: waste of surface area, and (later) size and separation of the desk and bench. The best aspect of this concept is the storage area under the seat.





Concept B- This concept explores the possibility of “puzzle-piece” parts. The idea couldn’t truly be utilized structurally. It would be too unstable in this form, and this kind of concept was discarded; though it was very educational to explore the possibility.



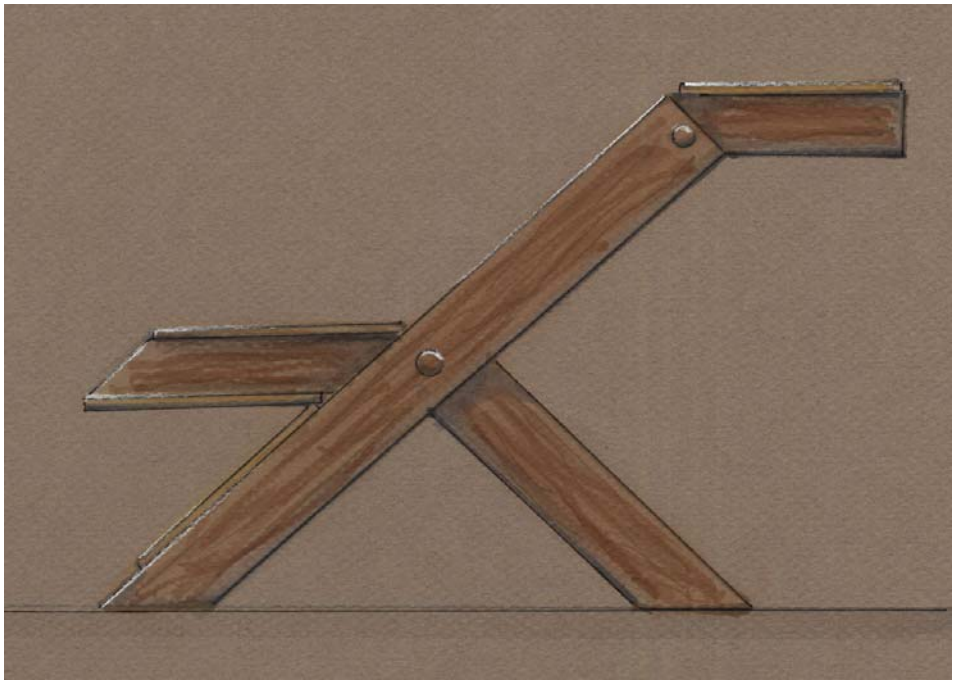
Concept C- This was my first attempt to address being efficient with the surfaces. Unfortunately, the efficiency of the material was lacking structurally. There were few locks and stops to keep the desk form collapsing.

Concept D- This attempted an aesthetic approach. The curves of the support legs were given to break up the rigidity of the form. The full-length hinge on the desktop was a precursor to final solution, but would be nearly impossible to construct by hand. The natural gravity locking of the desk was an added bonus to this concept, but creates several major pinch points. I often returned to this concept mentally to see if I could work it back in to my final.

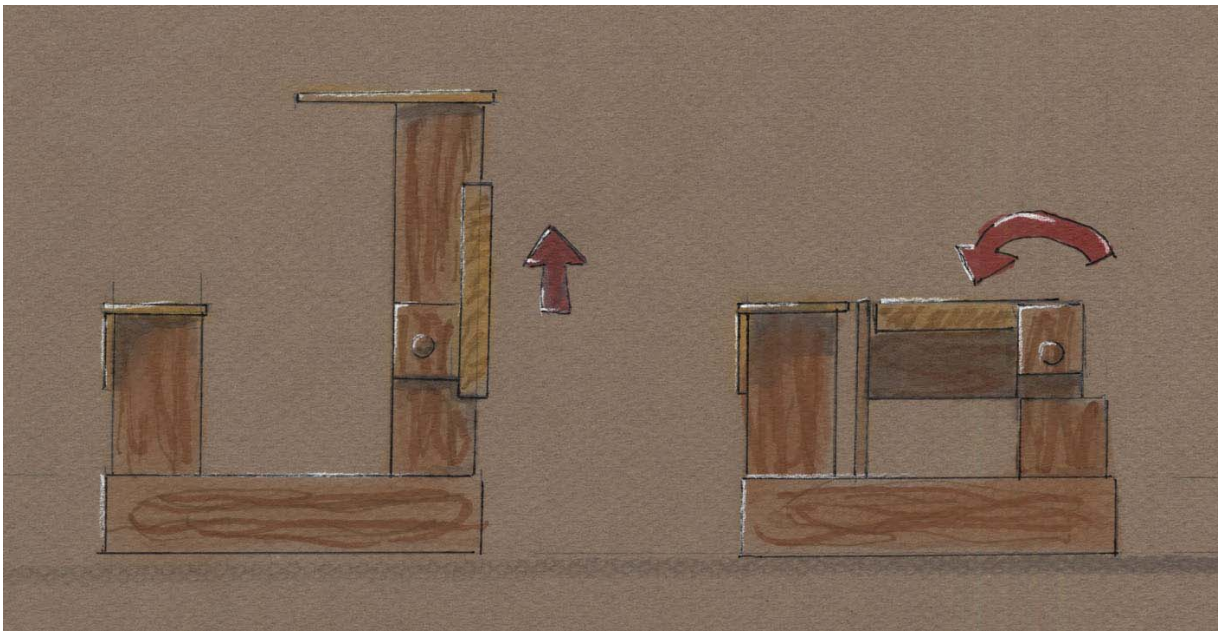
Model 1- 1:4 Scale

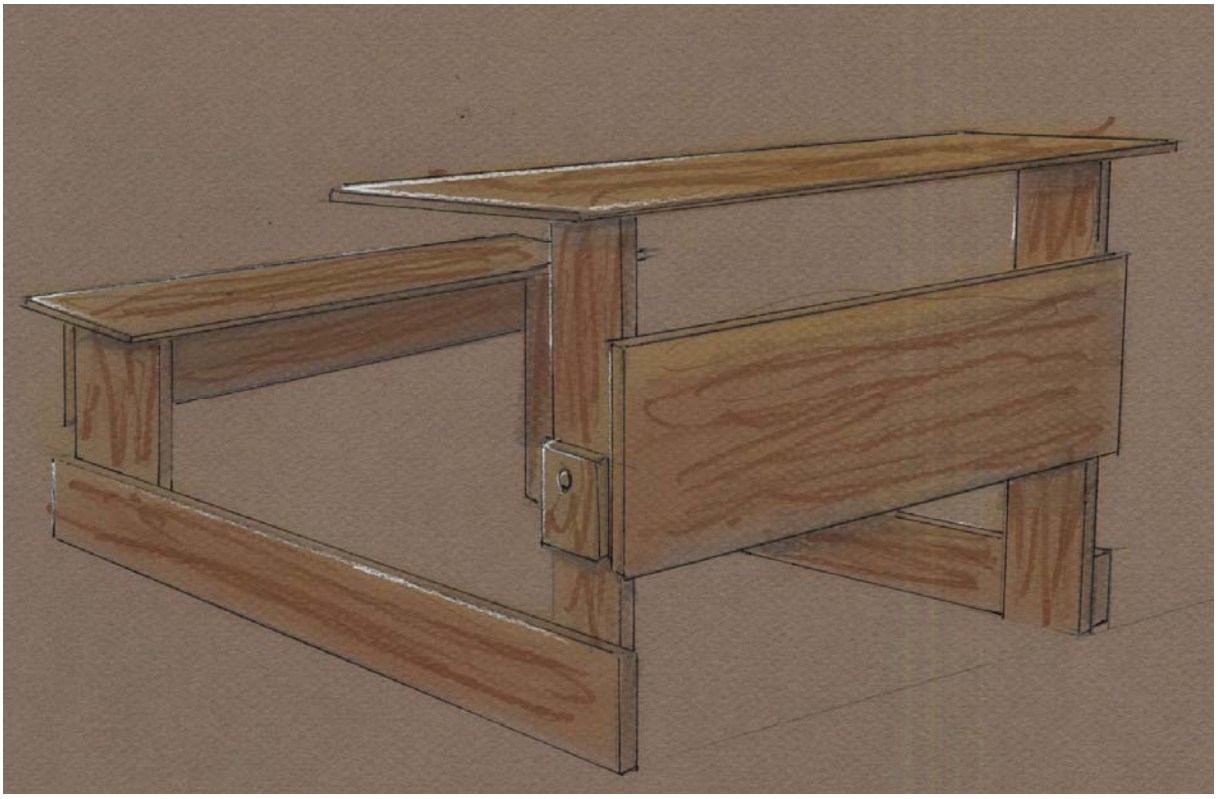
Concept C

7.92 Week 2- Concept Sketches and (2) Models

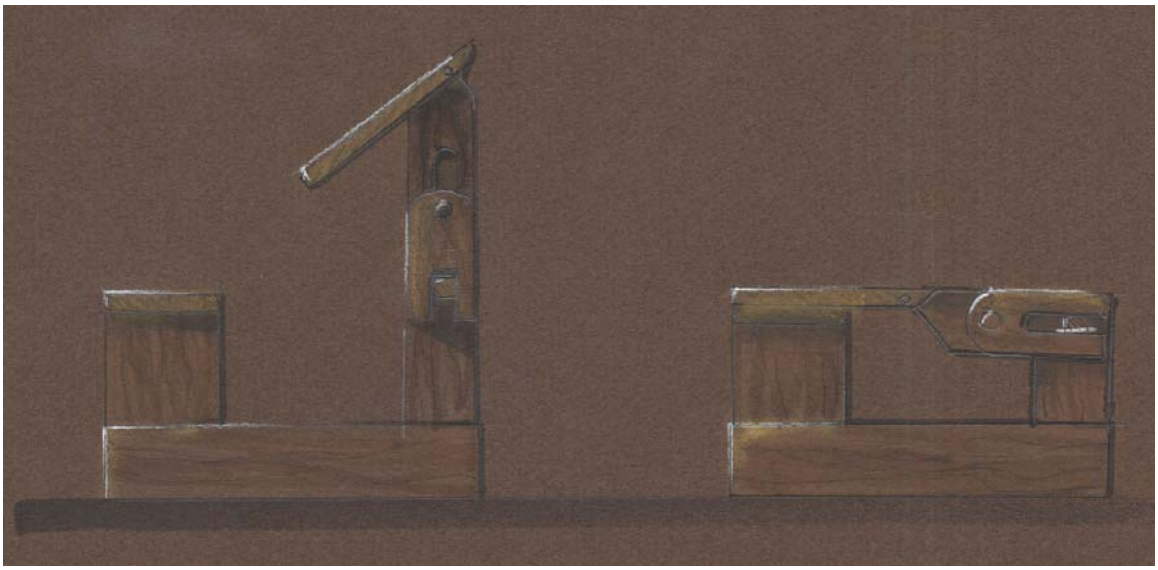


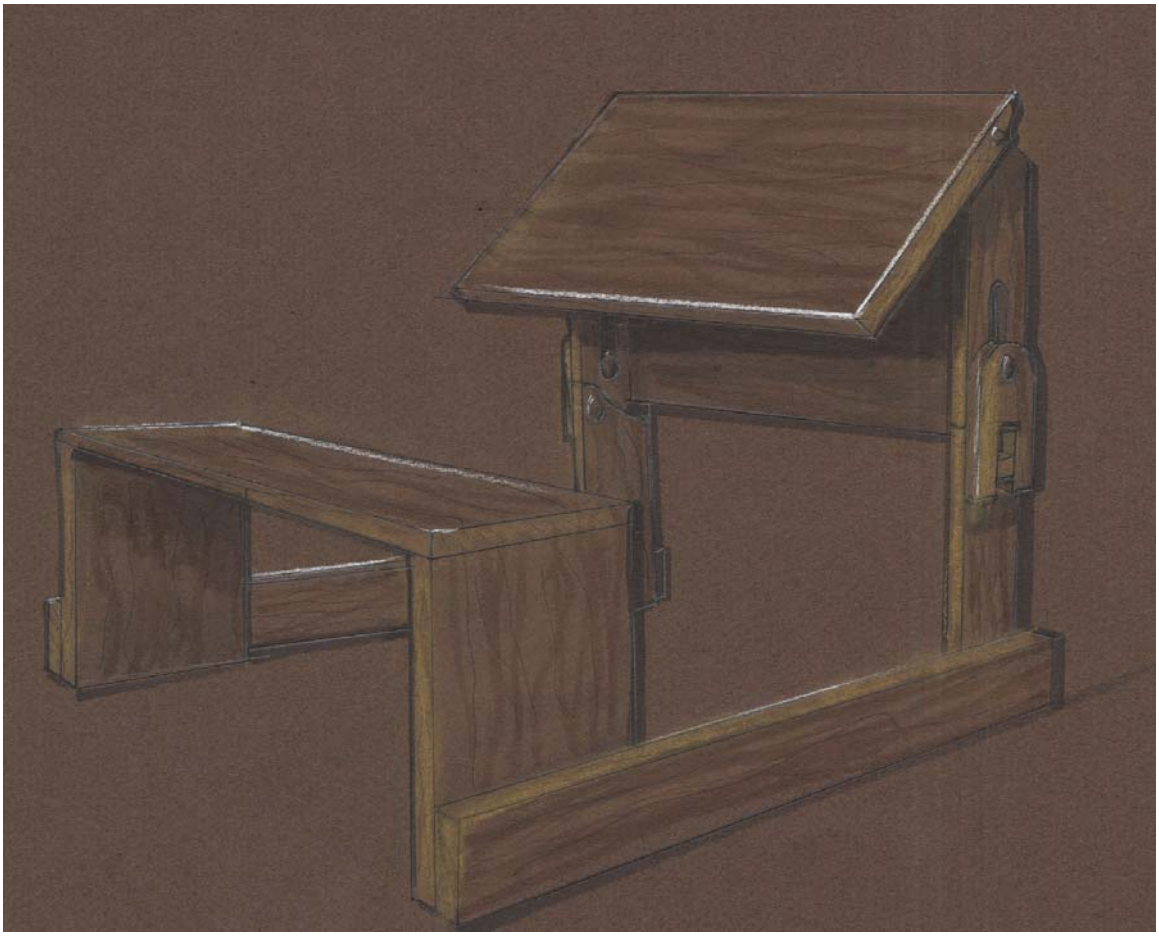
Concept E- This utilized the minimalist approach and tried to improve upon Concept D. Unfortunately, it wasted more surface area. Another problem that was brought up was the weight of the desk, and the fact that small children would have to be changing the desk into the bed pallet.



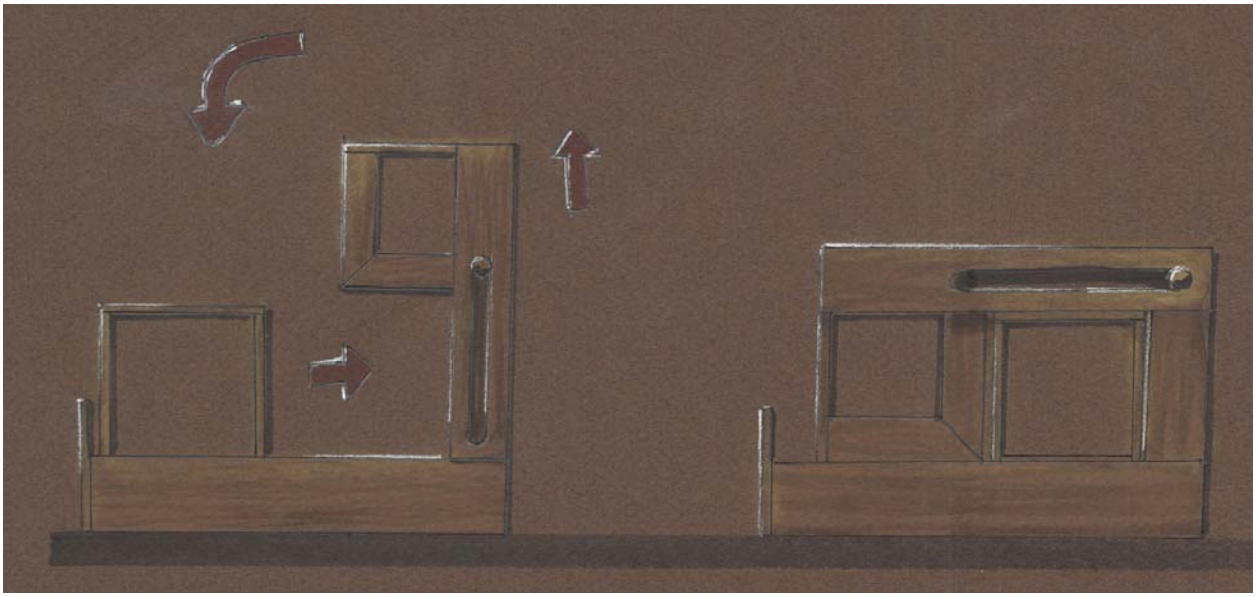


Concept F- Here I began exploring the need to conserve floor area. I began attempting to have the desk only take up the same area as a bed that is occupied as a desk.





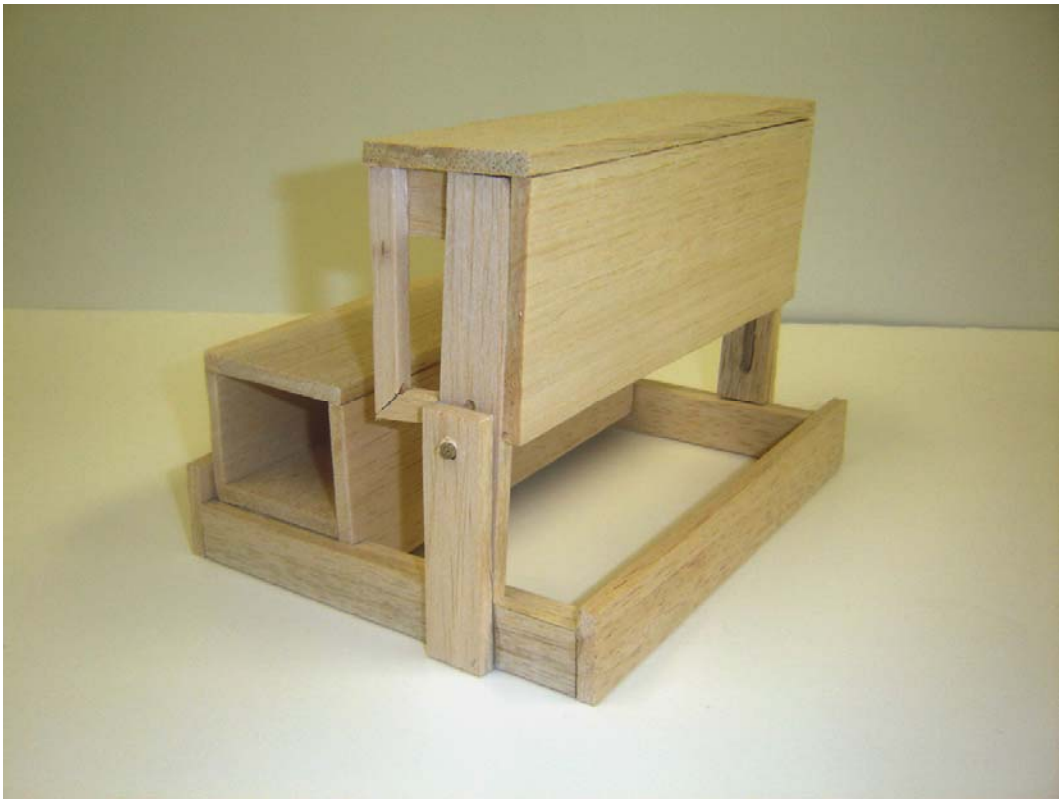
Concept G- This concept is unique with its slanted writing surface. I soon decided that this was not a good idea considering that the students are still learning to write.



Concept H- This was a fun concept. I enjoyed the cubist approach trying to reintegrate a storage area under the seat and maintain a simplistic approach for easy construction. Unfortunately, inefficient use of material and weight discounted this concept.

Model 2- 1:4 Scale

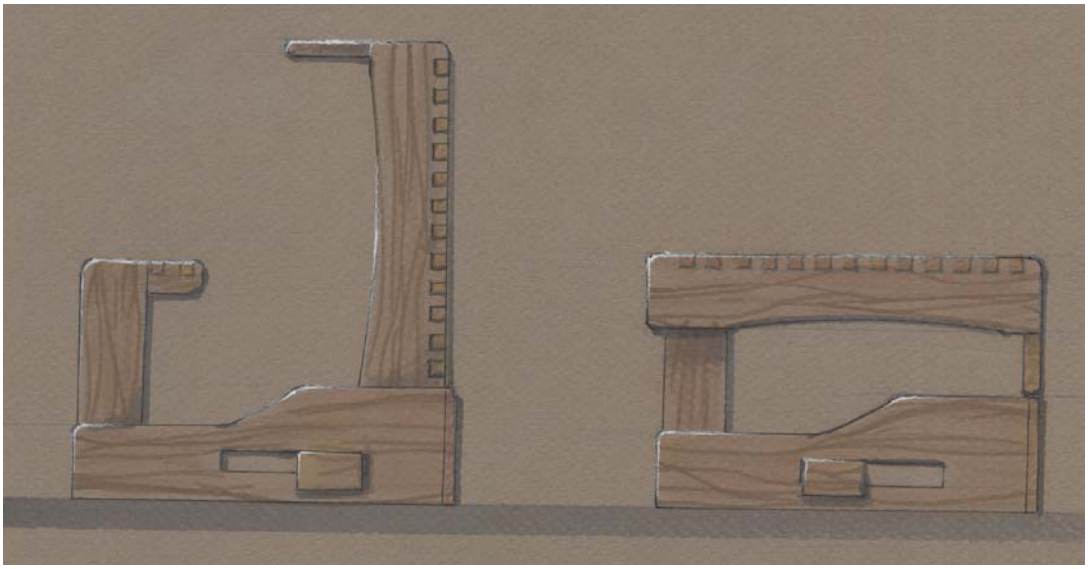
Concept F

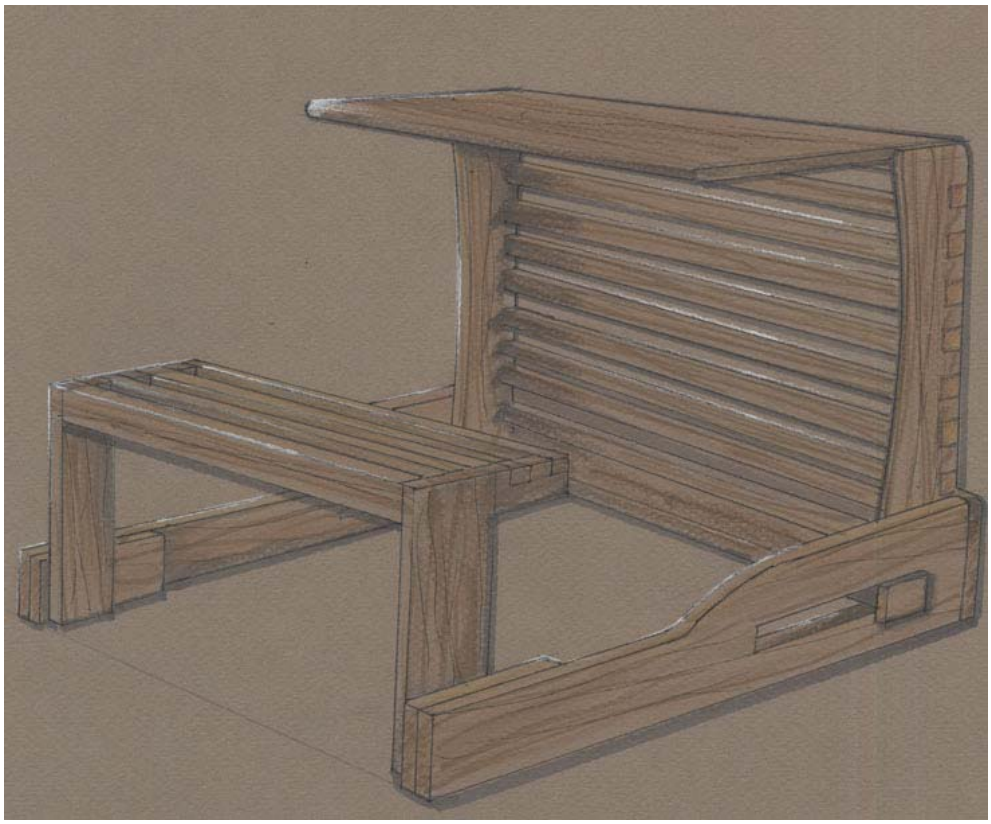


Model 3- 1:4 Scale

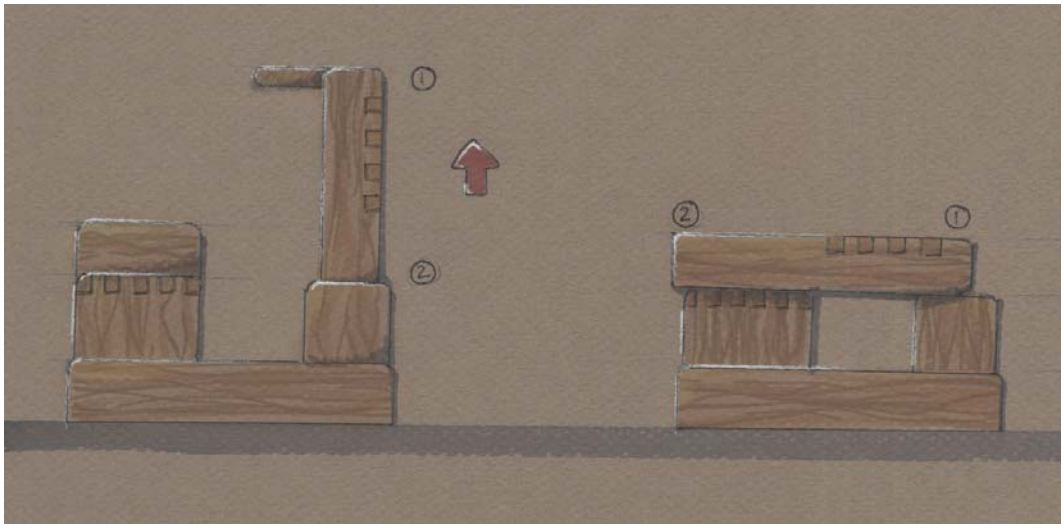
Concept H

7.93 Week 3- Concept Sketches and (2) Models

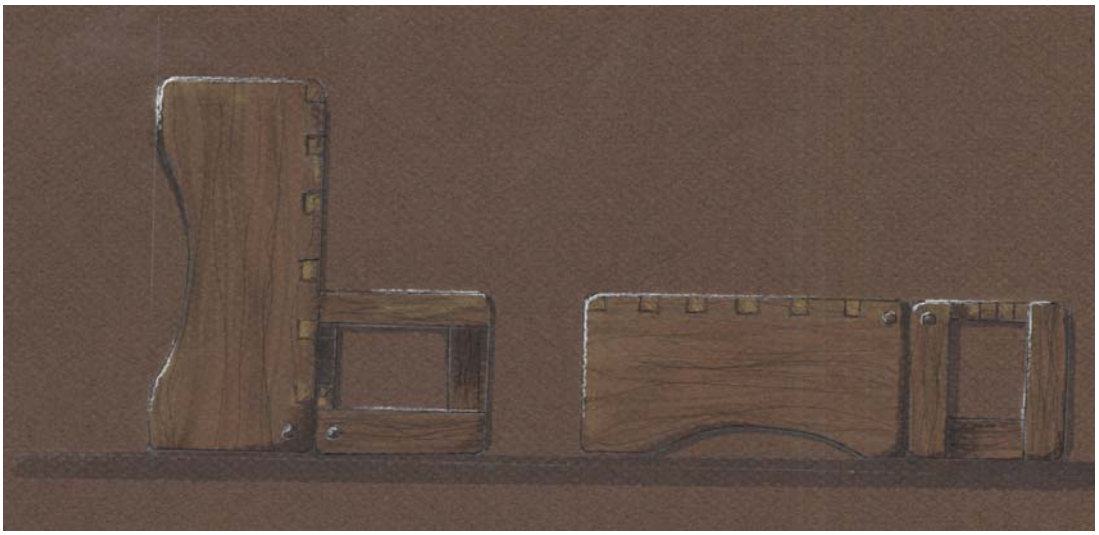




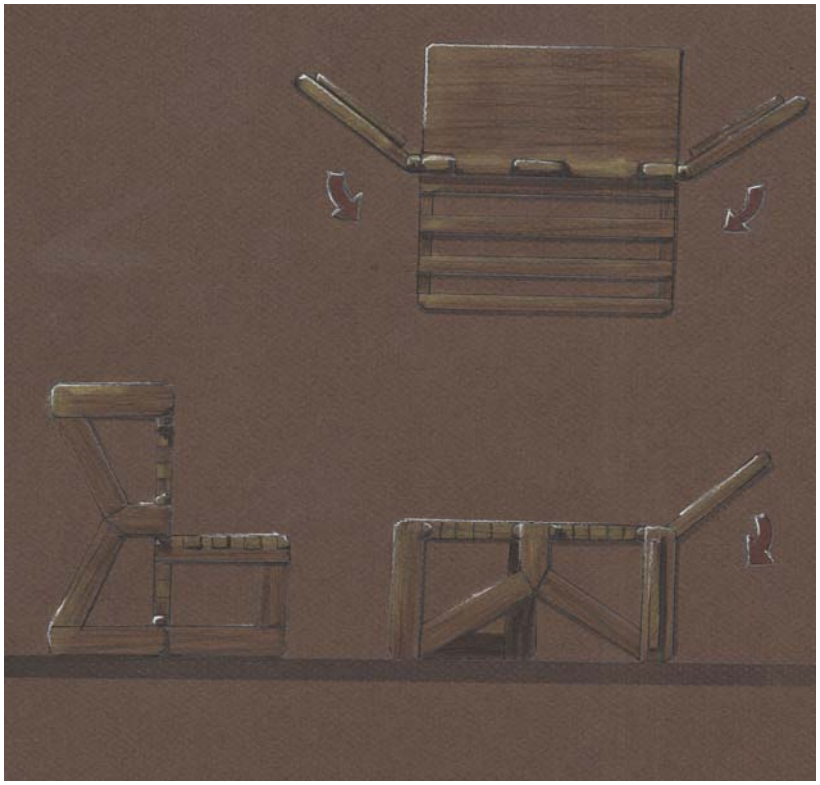
Concept I- Here is the first attempt at extremely efficient use of material. This was one of my first (of many) big revelations during this process. Unfortunately, it would be too easy for the writing surface to fall with the “locking” mechanism as it is.



Concept J- This concept began utilizing more efficient uses of material, and tried to address the sturdiness issues of concept I. It backed-up with the issue of it being too heavy and cumbersome for the children to convert it into a bed.



Concept K- Unknowingly, this concept ended up being an early solution for my final model- the issue of back support. This concept looked at the old Americana school desks that used the desk behind the bench, leaving the front row without a writing surface and the last row without a bench.



Concept L- Utilizing the same basic form as Concept K, this concept took efficiency of material to a new level. It was the wing-like sides and almost no extra room in the schoolhouse that prevented this concept from continuing.

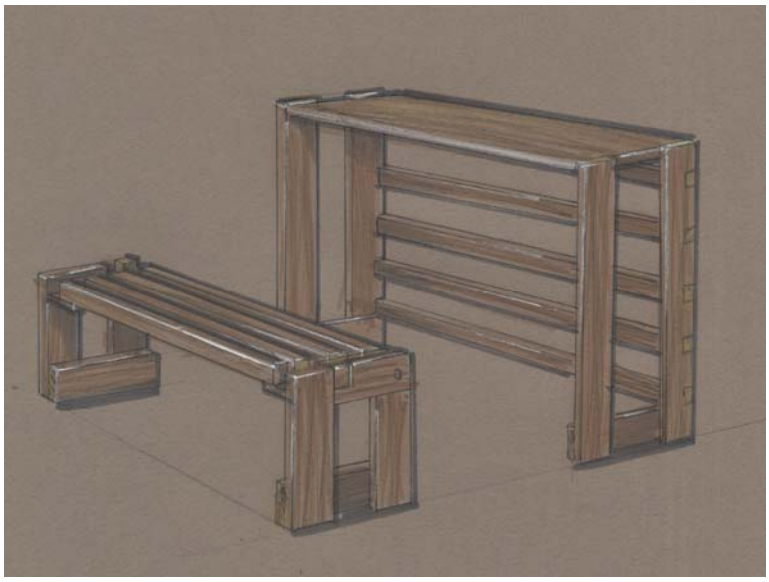
Model 4- 1:4 Scale

Concept I

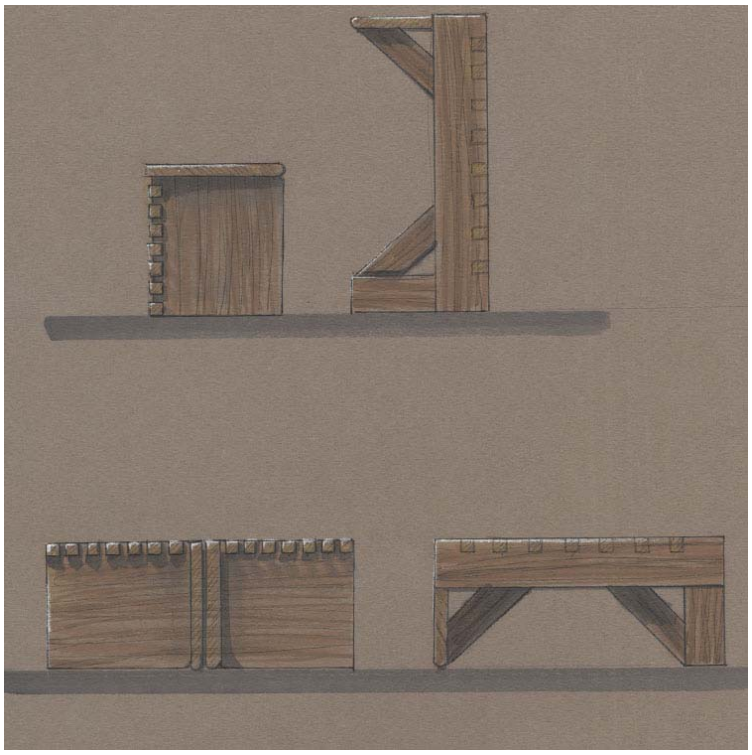
Model 5- 1:4 Scale

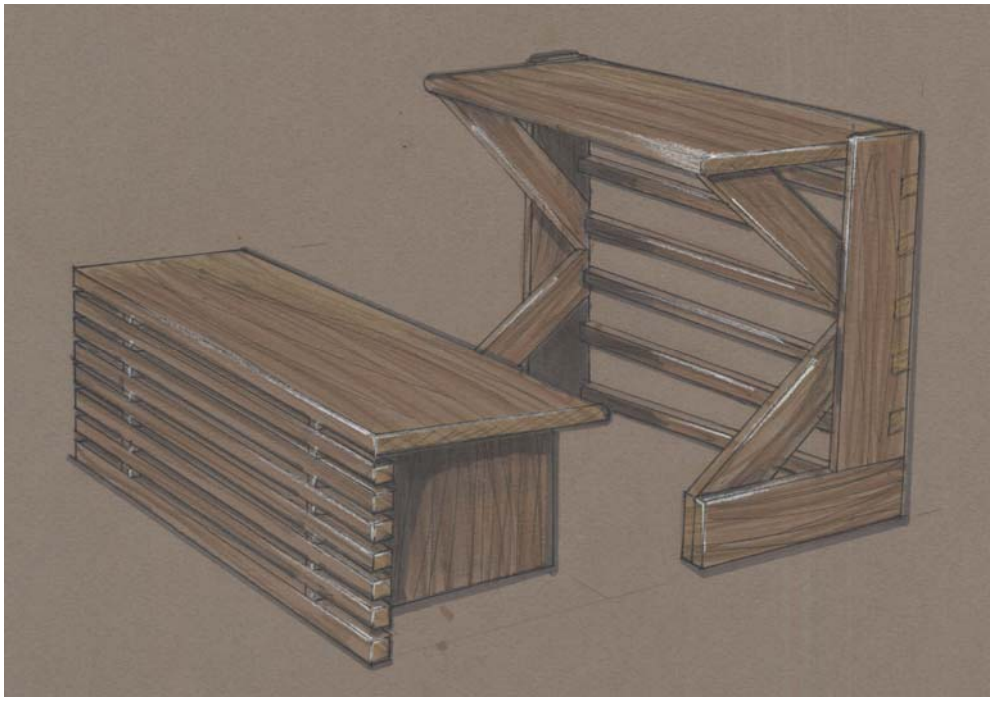
Concept L

7.94 Week 4- Concept Sketches and (2) Models

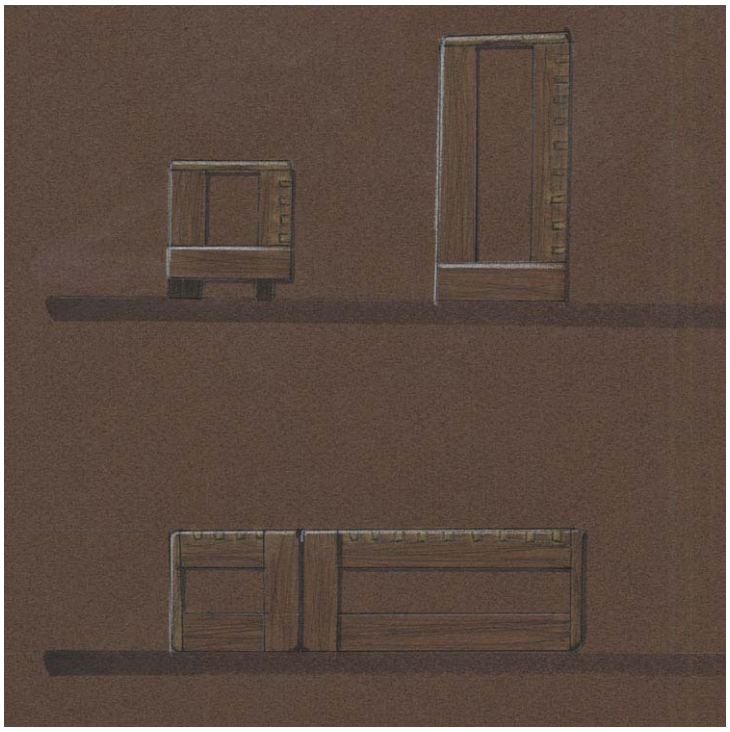


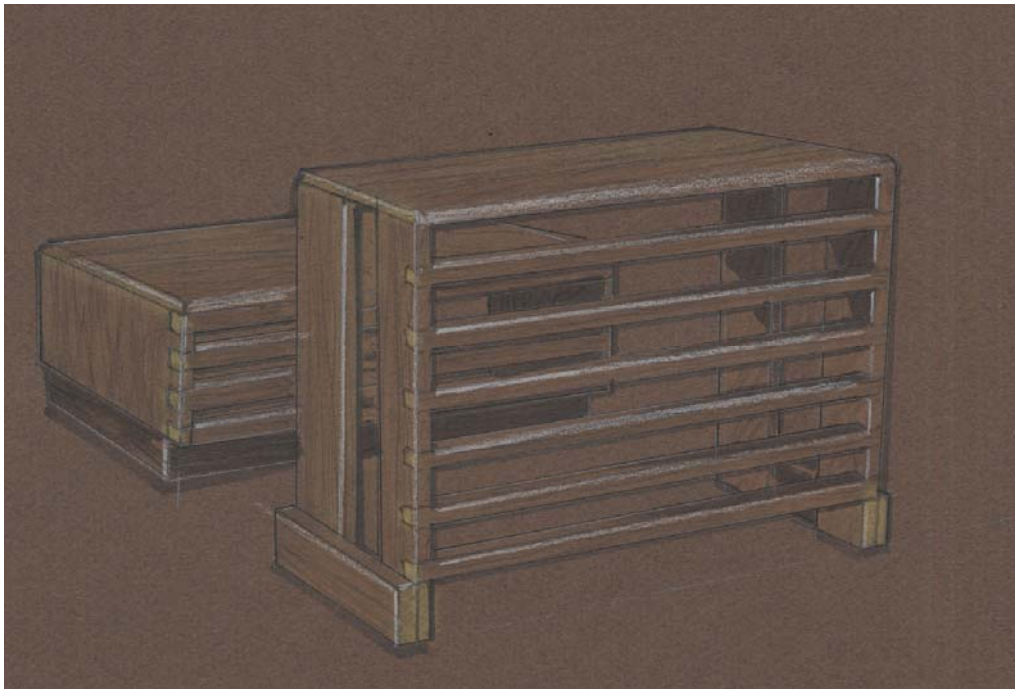
Concept M- The greatest step in these final concepts was the realization the bench and writing surface did not have to be connected. Because of this breakthrough, the assumption was that the desk could be a separate sleeping pallet from the benches; therefore, a locking system was needed to hold the desks together as a second set of pallets. The desk would not be very structural as is.



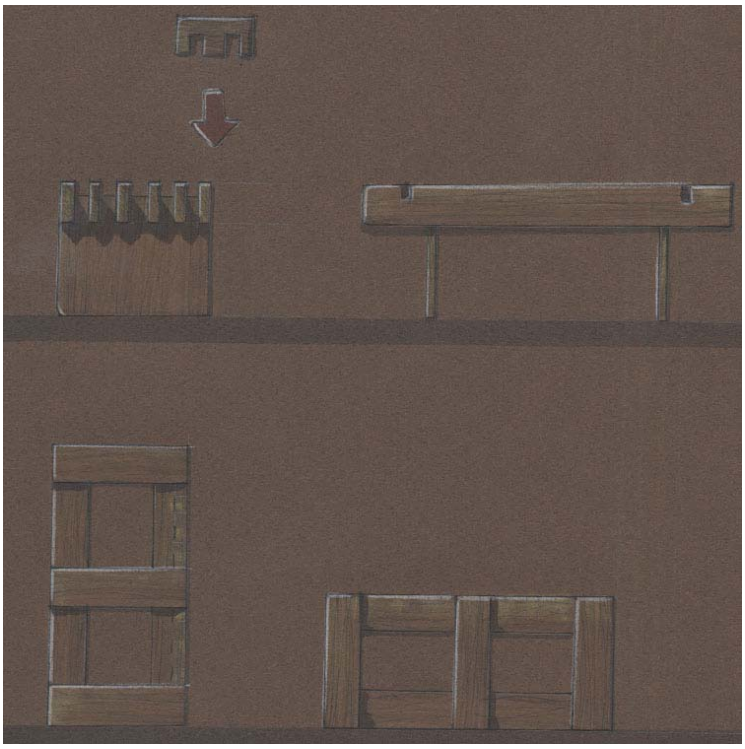


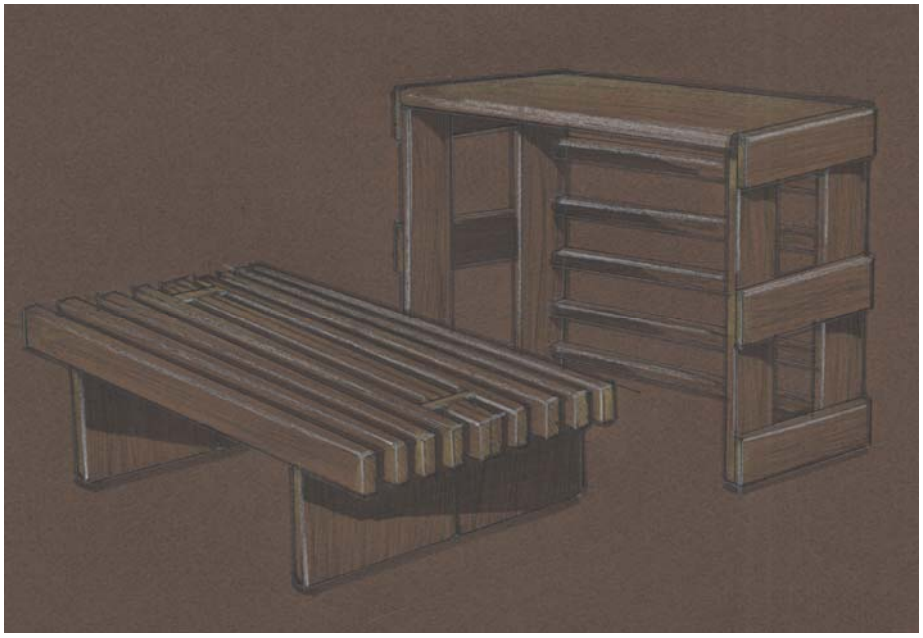
Concept N- This bench is my favorite concept. Unfortunately, as is, it is extremely inefficient. The desk was only an exploration in a different way to be more efficient.





Concept O- Here I realized that with a consistent width for both the bench and the desk, the height of the two could vary and still fit the two together as one bed pallet. Again, without more cross-bracing, there would not be enough support to hold a sleeper on the desk.





Concept P- This is a beautiful design, but still a step backwards. The bench is more efficient, but it is again separated from the desk. The desk is almost in its final form with the proper cross-bracing.

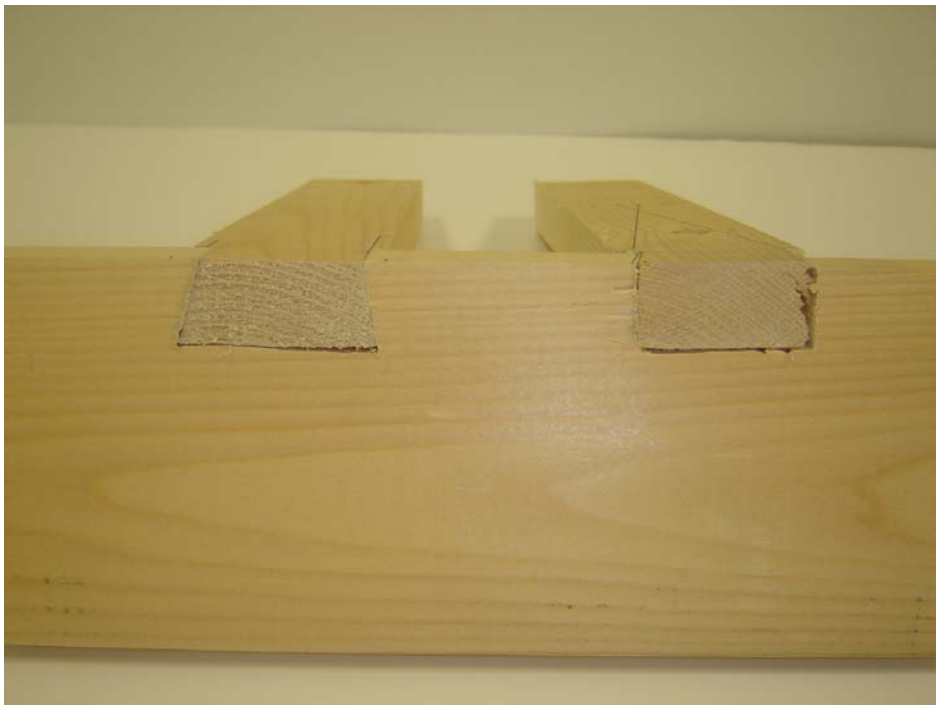
Model 6- 1:4 Scale

Concept M

Model 7- 1:4 Scale

Concept P

7.95 Wood-joint Study



Joinery study for cross slats. The “top-insert” dovetail was chosen for its strength and ability to hold the desk together.

7.96 Summary of Concepts

The development of the concepts evolved greatly throughout the four weeks. The research did not end here, but became more focused. The exploration into Herman Miller's bench (designed by George Nelson) was a great inspiration; though it could not be totally relied upon.

A combination of several elements was created. For the need to be efficient, slats were used. In order to save surface area, the desktop was hinged to rest on the face of the bench (which also had slats). An easy, yet strong, dovetail joint was chosen for the slats to hold the desk and bench together, while a mortise-and-tenon joint was chosen to attach the desktop to its supports. The bench-top remained stationary because it was deemed unneeded in order to meet the required length for the children who would be sleeping on the pallets. A breakdown of all of the concepts is displayed below in Table 2.

The bench and desk would form one bed pallet as a unit. The idea was to minimize movement of the furniture when laying it down to sleep on. Upon discussion with my professor, it was also decided to make the desk longer in order to accommodate more students at each desk/bed, therefore requiring fewer pieces.

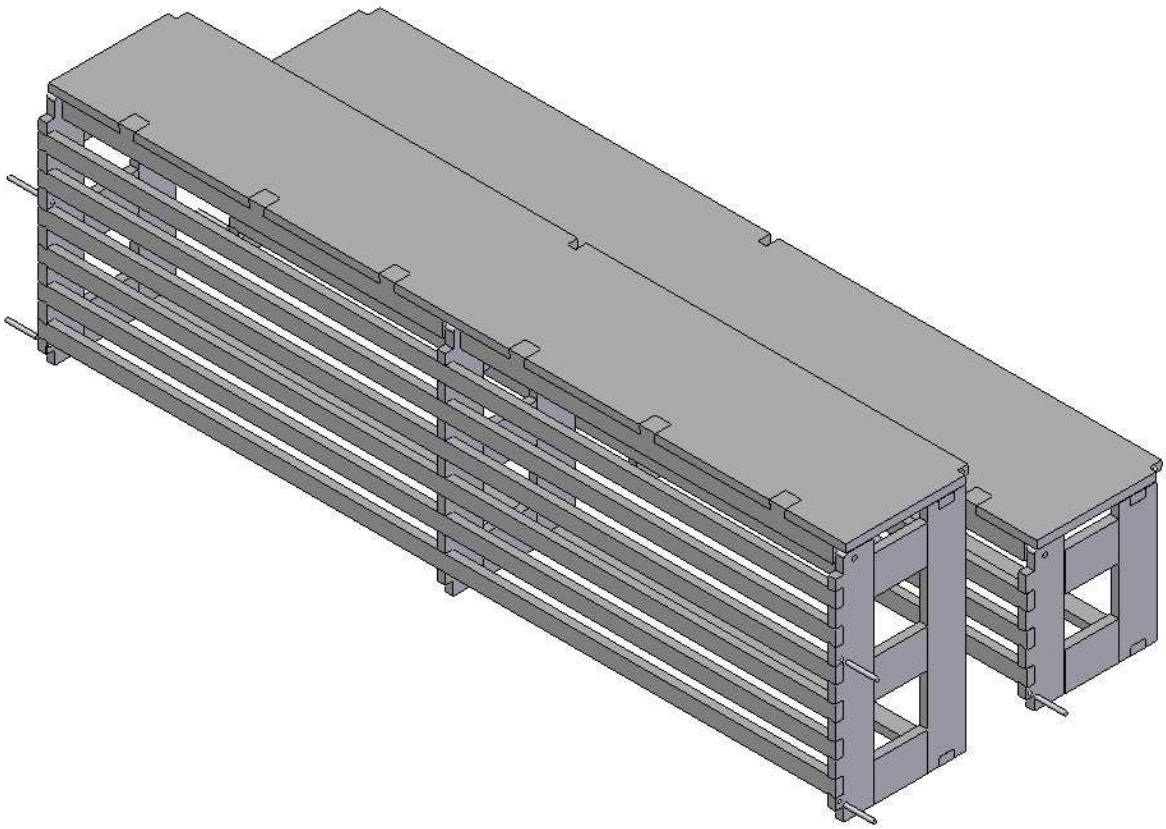
Concept	Bench						
	Separate places?	Use of surfaces	Surface Type	Support	Efficiency of Material	Use for Bed	Safety (1-10)
A	One unit	poor	plank	good	poor	good	3
B	One unit	good	plank	very poor	good	poor	4
C	One unit	good	plank	very poor	good	good	4
D	One unit	poor	plank	good	poor	very poor	3
E	One unit	very poor	plank	good	very poor	good	3
F	One unit	very poor	plank	poor	very poor	very poor	5
G	One unit	good	plank	poor	good	poor	4
H	One unit	very poor	plank	good	very poor	poor	5.5
I	One unit	very good	both	good	good	good	5
J	One unit	good	slats	very good	good	good	6
K	One unit	good	both	excellent	very good	very good	10
L	One unit	good	slats	good	good	good	6
M	Separate	very good	slats	good	very good	good	8
N	Separate	poor	both	excellent	poor	very good	10
O	Separate	good	both	very good	good	excellent	9
P	Separate	very good	slats	excellent	very poor	excellent	10

Desk						
Use of surfaces	Surface Type	Support	Efficiency of Material	Use for Bed	Safety (1-10)	
tinted top	both	poor	very good	good		7
very good	both	good	very good	good		8
very good	both	poor	excellent	very good		7
very good	both	very good	good	very good		10

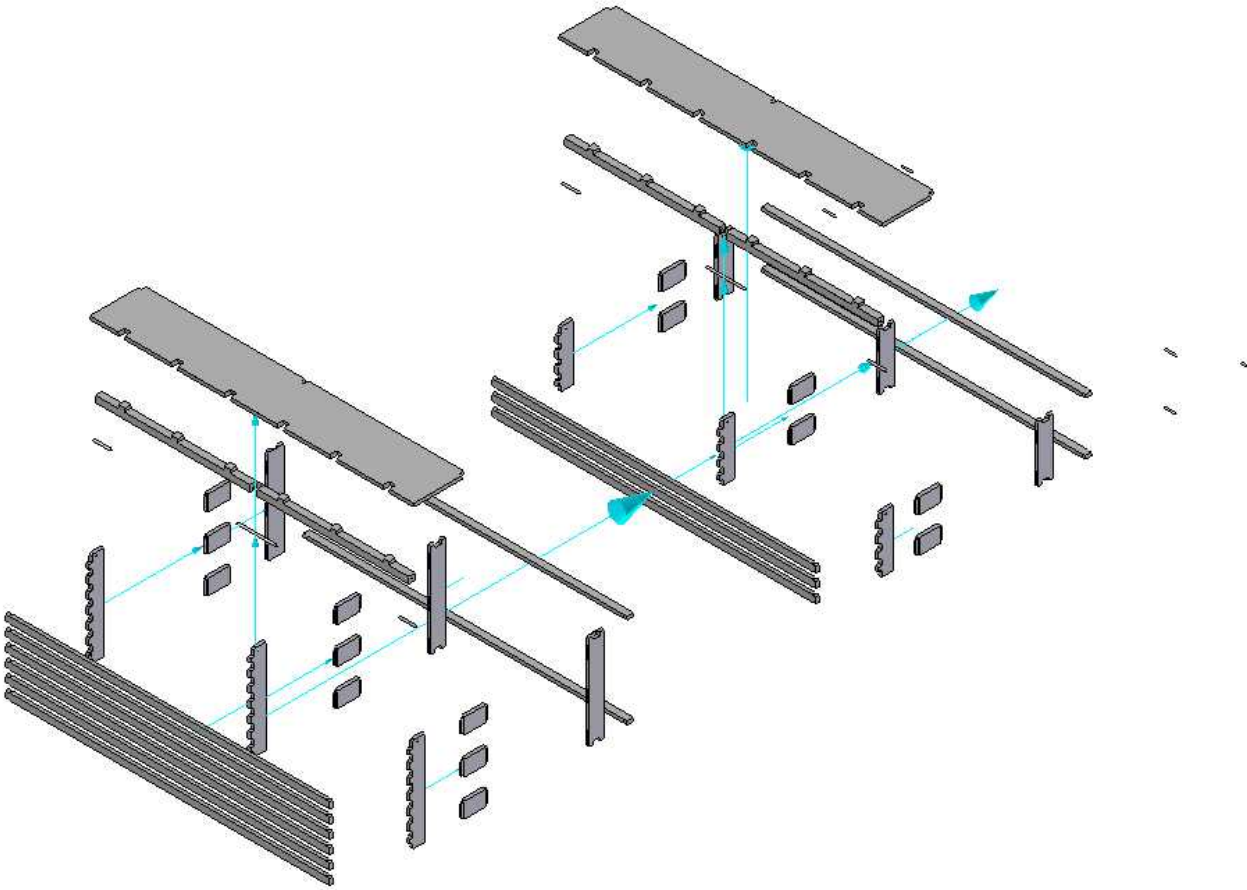
Ideal	Separate	good	both	very good	very good	excellent	9	excellent	both	very good	excellent	excellent	9

Table 2

7.97 Control Drawings



Full Perspective View (CAD, SolidEdge v.15)



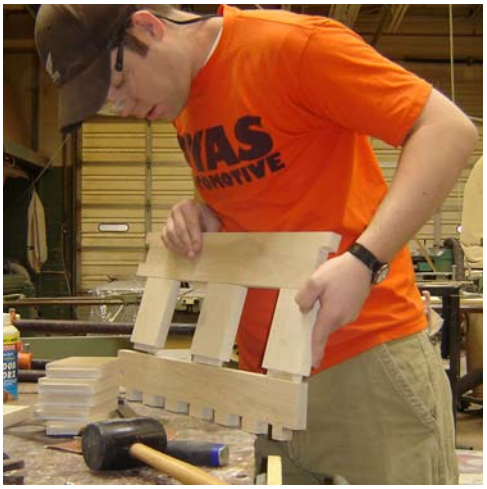
Exploded View (CAD- SolidEdge v.15)

7.98 1:1 Scale Mock-Up

1:1 Scale Mock- up - This model answered many of the problems that needed addressing. Unfortunately, the desk height did not take into account the anthropometrical data and was too tall. It was also a little too weak and requires more structure. The mortise-and-tenon joints for the desktop were not the best solution, and a new solution had to be figured out.

7.10 Final Model

7.101 Photographs of Construction



7.102 Sequence of Use Evaluation

1. Desk

2. Bench in front of desk provides back support.

3. Insert peg to hold bench in front of desk.

4. Open desk and bench tops.

5. Lay furniture down to form bed.

6. Insert peg to lock bed in place.

7.103 Anthropometric Views of Final Model

The desk ideal in height (22”) and the bench can be adjusted back and forth to maximize comfort.

7.104 Photographs of Final Model

Front (Right Angle)

Front (Left Angle)

Left Side

Back (bench removed)

Close-up of desk slats.

Front

Back (Right Angle)

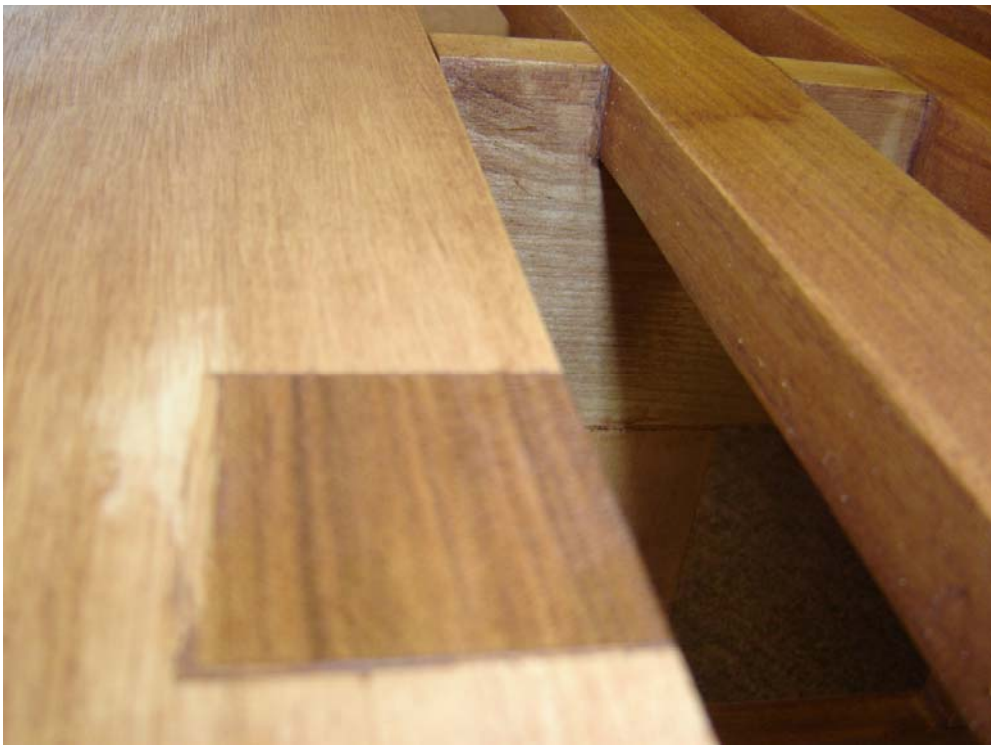
Bench in front (Left Angle)

Peg to hold bench to desk

Open hinged tops

Bed pallet

Groove cut into tops to keep pallet from slipping.



Top of dovetail joint in desktop surface.

Peg holding bed pallet together.

7.11 Summary of Project

The final model was very satisfactory. The joints did not work perfectly, but woodworking techniques were able the blend in any blemishes or imperfections well. Though not explained earlier, the desk was made six feet wide for the 1:1 scale mock-up in order to reduce work for the children, and to maximize the capacity for every desk. Because it worked so well for the prototype, the final was also made this long. Cherry was selected as the color of stain for the maple. If able to be refinished, some work may go into a more accurate color, but the choice was also selected to complement the wood chosen for this particular model.

The model has been tested for structural integrity. It is able to hold at least 400 pounds on the bench alone, and the bed slats diffuse the weight of a 200 pound man. A thin foam camping mattress was chosen as the cover for the bed. It is durable and resistant to moisture. The pad rolls up neatly to store under the bench during the daytime, and offers sufficient cushion for sleeping. It is understood that the final bench top (in a row of connected bed pallets) would not be utilized unless it was braced by an independent support. This is the area (bed surface area) that could use some more research if the design project were to continue. An independent support could easily be constructed, but the overall design could possibly be modified to provide a brace within the form.

The project was completed as a good model, but the solution did not answer every question. The pins holding the two pieces together were small and detached, and could be easily misplaced; a tether would simply get in the way. Also the only adjustability for growing children was that the bench could be moved back and forth away from the desk.

An ideal situation would allow for two or three editions of the final piece that were different sizes. This would accommodate for the inevitable growth of the children.

8.0 FINAL CONCLUSIONS

The project successfully demonstrates the overall concept of the need for a new perspective when considering another culture. The furniture piece was chosen to act as a real world example of how industrial design in general can help to improve the lives of people in any situation in life. It also shows that a different set of restrictions and criteria are placed on a designer when they work with another culture.

The theory that was tested and proven during this paper was whether or not the industrial design thought process of the western world could be modified to fit the needs of a third world people group. More specifically, the design process was tested with the steps employed by Christian mission agencies around the world; these agencies spend their efforts interacting with unreached third world people groups to meet their very basic physical, emotional, and spiritual needs. A focus on furniture design was made to show how the revised process could work.

The results of this thesis conclude that indeed a different culture, anywhere in the world, places such different requirements on a design project that an adaptive viewpoint is necessary. The design process as a whole was not removed; in fact, it was added to. The addition of an Integration Phase at the beginning of the process, and a Follow-Through Phase at the end of the process, allow for a potential designer to address all of the extraneous issues that are brought about with a new cultural experience. The steps emphasized in the project were determined based on the present methods of the Modern Mission Movement. The goal of both the mission movement and the design process coincide in their goal to improve the lives of those they interact with.

Ultimately, this project was a success. Given its broad subject matter, more specific studies can be made to further test its validity. The focus can be changed from one design field to the next with minimal effort. It is intended for the results of this thesis to be shared throughout the industrial design field in order to encourage designers to adapt its findings to the needs of the people they are working with, and not remain strictly in the furniture industry. The success of the final project, the HomeSchool, and the success of other professional fields in missions give way to the assumption already ascertained; industrial design has a place to contribute in the mission field. Further study may elaborate on aspects of design other than furniture, and it may encourage mission design firms that could be investigated in the future. For now, the industrial designer may refer to this study as a guideline for interacting with other cultures on a short or long-term basis; for the furtherance of the Gospel.

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10.0 APPENDICES

Appendix A

Top 25 Countries by highest percentage below poverty line

Definition: National estimates of the percentage of the population lying below the poverty line are based on surveys of sub-groups, with the results weighted by the number of people in each group. Definitions of poverty vary considerably among nations. For example, rich nations generally employ more generous standards of poverty than poor nations.

1. Zambia 86% (1993)
2. Gaza Strip 81% (2004 est.)
3. Moldova 80% (2001 est.)
4. Chad 80% (2001 est.)
5. Haiti 80% (2003 est.)
6. Liberia 80%
7. Guatemala 75% (2004 est.)
8. Suriname 70% (2002 est.)
9. Zimbabwe 70% (2002 est.)
10. Mozambique 70% (2001 est.)
11. Angola 70% (2003 est.)
12. Sierra Leone 68% (1989 est.)
13. Burundi 68% (2002 est.)
14. Bolivia 64% (2004 est.)
15. Mali 64% average (2001 est.)
16. Niger 63% (1993 est.)
17. Nigeria 60% (2000 est.)
18. Comoros 60% (2002 est.)
19. Tajikistan 60% (2004 est.)
20. Rwanda 60% (2001 est.)
21. West Bank 59% (2004 est.)
22. Turkmenistan 58% (2003 est.)
23. Malawi 55% (2004 est.)
24. Colombia 55% (2001)
25. Sao Tome & Principe 54% (2004 est.)

Top 25 Countries by highest Gross National Income

Definition: GNI, Atlas method (current US$). GNI (formerly GNP) is the sum of value added by all resident producers plus any product taxes (less subsidies) not included in the valuation of output plus net receipts of primary income Per capita figures expressed per 1 population.

1. Luxembourg $37499.20 per person
2. Switzerland $36987.58 per person
3. Japan $35474.07 per person
4. Norway $35053.34 per person
5. United States $33070.25 per person
6. Denmark $30191.45 per person
7. Iceland $27473.76 per person
8. Sweden $25105.53 per person
9. UK $24486.68 per person
10. Austria $23824.06 per person
11. Netherlands $23770.34 per person
12. Belgium $23639.52 per person
13. Finland $23549.68 per person
14. Germany $23534.83 per person
15. France $22751.25 per person
16. Ireland $21846.50 per person
17. Brunei $20823.12 per person
18. Canada $20789.51 per person
19. Singapore $20066.03 per person
20. Italy $19276.11 per person
21. Australia $19213.53 per person
22. United Arab Emirates $19198.25 per person
23. Israel $17046.35 per person
24. Kuwait $15992.17 per person
25. French Polynesia $15023.53 per person

Appendix A

Refugees
(number in each country, 1990-99)

Amount
1. Iran 1,931,300
2. Germany 1,319,200 (Asylum-seekers)
3. Bosnia and Herzegovina 1,206,700
4. Pakistan 1,202,670
5. Rwanda 892,110
6. Sierra Leone 878,300
7. Azerbaijan 798,190
8. Sri Lanka 717,760
9. Afghanistan 537,400
10. Sudan 454,980
11. Guinea 413,700
12. Liberia 354,520
13. Armenia 310,010
14. China 292,300
15. Ethiopia 284,930
16. Georgia 277,020
17. Burundi 250,550
18. Kenya 244,620
19. Uganda 206,930
20. Guinea-Bissau 202,200
21. India 185,510
22. Croatia 184,820
23. Belarus 176,480
24. Algeria 165,330
25. Canada 159,000 (Estimated data)

Top 25 Countries by least amount of available water

Definition: Percent of country's territory under severe water stress
Units: Percent of Land Area
Units: This data is derived from the WaterGap 2.1
gridded hydrological model developed by the Center for Environmental Systems Research, University of Kassel, Germany.

Amount
1. Trinidad/ Tobago 100.00 (1961-1990 (avg.))
2. Israel 100.00 (1961-1990 (avg.))
3. Syria 99.60 (1961-1990 (avg.))
4. Nepal 98.10 (1961-1990 (avg.))
5. Kuwait 97.70 (1961-1990 (avg.))
6. Azerbaijan 95.40 (1961-1990 (avg.))
7. Belgium 93.90 (1961-1990 (avg.))
8. Tajikistan 93.20 (1961-1990 (avg.))
9. Kyrgyzstan 93.00 (1961-1990 (avg.))
10. Turkmenistan 92.90 (1961-1990 (avg.))
11. Macedonia 91.60 (1961-1990 (avg.))
12. Tunisia 89.00 (1961-1990 (avg.))
13. Saudi Arabia 88.30 (1961-1990 (avg.))
14. Egypt 88.10 (1961-1990 (avg.))
15. Iran 87.50 (1961-1990 (avg.))
16. Uzbekistan 87.10 (1961-1990 (avg.))
17. Iraq 86.90 (1961-1990 (avg.))
18. Armenia 84.60 (1961-1990 (avg.))
19. Libya 83.70 (1961-1990 (avg.))
20. Jordan 82.60 (1961-1990 (avg.))
21. Lebanon 82.10 (1961-1990 (avg.))
22. Morocco 81.50 (1961-1990 (avg.))
23. India 80.20 (1961-1990 (avg.))
24. Pakistan 76.30 (1961-1990 (avg.))
25. United Arab Emirates 74.00 (1961-1990 (avg.))

Appendix B

SAMPLE Gantt Chart

			Start Date
Integration	Identify Receptive areas	Undetermined amount of time	
	Find a Helper		
	Earn people's trust		
	Learn to communicate		
	Gain cultural perspective		
	Share designer's own culture	Begin study of Bible	
Research	marketing	Access local business knowledge	
		locate potential buyer/user market	
	production	study local production methods	
		determine material resources	
		study alternative materials	
	human	local culture	
		local needs	
		approval of project by the people	
	technical	study capabilities of production	
		what can be introduced?	
Development	sketching		
	modeling		
	conceptualizing		
	decide on materials		
	scale mock-ups		
	testing		
	approval		
	technical drawings		
	prototype		
	final adjustments		

Appendix B

Commmunication/ Education	presentation/project reveal		
	teach production methods		
	teach business theories		
	compile data resources		
	turn project over to people		
Follow-Though	organize production		
	develop business chain		
	help with marketing		
	organize logistics		
	train other workers		
	meet emotional needs		
	share Gospel		
	move on/start new projects		
	send out trained workers		