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This paper gives a brief overview of five aspects of school media centers' facility design--lighting, acoustics or sound, furniture style and arrangement, temperature control, and color schemes. These five aspects, each of which can impact student learning, are then used to evaluate the design of five school library media centers in North Carolina. Personal interviews with the Media Specialists of the selected media centers provide insight into which of these aspects they believe are critical to creating a media center that is effectively utilized by its school population.

Headings:

> Space/ Architecture
>
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>
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FIVE ASPECTS OF DESIGN IN A SCHOOL MEDIA CENTER

by
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Introduction

Lately, I have noticed an abundance of literature on new young adult spaces in public libraries. Librarians have clearly recognized that young adults and teens use library space differently than children or adults do, and have begun to make accommodations for this difference. Yet there has been little attention focused on how to redesign school library media centers to maximize their usage. With a background in K-12 education, I am also aware of the large quantity of research literature that addresses how students learn and discusses the factors that affect student learning. Taken together, these resource pools can provide school media specialists with a better understanding of the properties of a good school library media space.

I began my search for literature in databases that are subject specific for education (ERIC, Education Full-Text via Wilson Web) and library science (LLIS, LISA). I found many articles in each of these databases, and selected articles by their title/abstract for further reading. Many of these articles were only superficially related to my topic or discussed a particular library renovation, but I was able to find several articles that discussed one or more of the aspects I wanted to investigate in depth. These I marked as helpful and continued searching for more resources. I was able to find several books on library facilities that had chapters that were relevant, and a few books on teaching and education which discussed the physical classroom and student learning styles.

In reviewing the literature on library facilities, it became clear that the physical aspects of libraries, and classrooms, could be categorized into five general groups, each

of which has a significant impact on a media program. These categories include lighting, acoustics or sound, furniture, climate, and color.

Another interesting theme I noticed was the type of "spaces" that should be included in a school media center. Of course, a media center should have space dedicated to its print resources (general shelving). Other spaces that were mentioned included meeting spaces for students to work in small groups or for faculty committee meetings, study spaces for individual or group study, reading spaces for recreational reading of books and journals/ newspapers, and research spaces such as computer labs and reference areas (Crawford, 1999). Additional spaces include teacher workrooms, media specialist offices, and circulation and AV spaces (Klafehn, 2006). Most sources agreed that each type of space has unique requirements for lighting, acoustics, furniture, color, and climate.

Finally, the literature on learning styles showed that no two students learn the same way. The most commonly applied learning styles are visual, auditory, and kinesthetic. Most learners will exhibit a preference for one of these styles, although they may be able to learn through more than one style. Visual learners are sight-stimulated, either through written words or images and viewings. Auditory learners are at their best when they can hear what is being taught. Kinesthetic learners do best in active situations, where they are either physically doing an activity or touching items they are learning about. One can enhance all learners' education by ensuring the media center has spaces and facilities for all learning styles to flourish.

Clearly, in designing school library media centers, there are a number of factors which should be considered. This paper will first discuss the five key categories of

physical space identified in the literature—lighting, acoustics, furniture, climate, and color—with an emphasis on the intersection of these elements and learning styles. It will also provide suggestions or recommendations for each element. It will then present an evaluation of five school library media centers which was undertaken to determine how well they incorporated each aspect into their design and layout. Deficiencies and gaps will be analyzed, and finally changes to improve the spaces will be recommended.

Literature Review

The five elements discussed above, lighting, acoustics, furniture, climate, and color, will be explored in the literature review. Lighting will be discussed with consideration of lighting requirements and type of lighting. The acoustics of a library are inherently different than acoustics in a classroom, with varying levels of sound required in the various parts of the media center. I will provide examples and suggestions for improving acoustics in the school library media center. Appropriate and mobile furniture will be described with respect to the different spaces of the media center. The temperature or climate of a room can affect student learning, as well preservation capabilities of libraries, both of which should be considered for a school library media center. Colors can influence how a room is perceived by visitors, and will be discussed with reference to promoting and hindering learning.

Lighting

School media centers should be the hub of a school's learning community. As a focal point in the school, the media center should be well lit. Lighting has been shown to have an affect on student learning, indicating that light levels must be considered as part

of a space that will be used by students for learning. There has been an ongoing discussion of what the 'best' light source for a library is for many years. Between considering light sources and their affect on student learning, there are many factors that must be considered when determining the type of light to be used in a school media center. The intensity of light (brightness), the quality of light (diffused or direct), the lighting needs of specific areas, aesthetic effect, and cost are considerations listed in *Library Buildings: Planning and Design* (Kaula, 1970).

Have you ever had the power knocked out at your house during a storm? You find the flashlight, realize the batteries are dead, and decide to light a couple of candles instead of hunting for new batteries. Then you pick up your overdue library book, deciding you might as well read, since you can't watch *The Office*. After squinting at the small print on the page in the candlelight for about 5 minutes, you give up, and decide to go to bed early. While I doubt any person would encourage the use of candlelight in a book-filled library, the lack of sufficient lighting is the key here. At the other end of the spectrum, imagine trying to read a piece of "bright white" paper while you are outside on one of those exceptionally bright, sunny, cloudless days. Your eyes begin to water as you squint towards the paper, trying to shade your eyes from the bright sunlight that is reflected from the paper in your hand. For students who are studying, researching, or reading in a media center, light must be sufficient but not overly without glare. Glare is the reflection of light from a surface. Glare is most common on brightly colored or shiny surfaces, and can cause discomfort or difficulty in reading.

There has been debate over the type of lighting to be used in media centers and libraries over the years. This is especially true when considering maintenance and

preservation of library resources. Direct sunlight may damage books and other resources over time, as well as create glare on computer screens, or simply heat a room beyond comfort. This type of natural lighting can be variable: on an overcast day, it may provide insufficient light for using a media center on its own. These are all compelling reasons to use electric lights. However, electric lights burn out and require replacements; this and the expense of electricity can add up in cost. Electric lights may also cause glare on computer screens, depending on how and where they have been installed in the media center. It is easier to reduce glare from sunlight by adding shades or drapes to the windows than it is to try to block glare from electric lights that have been permanently installed in a way that interferes with computer usage.

In a study by Rayneri, Gerber and Wiley (2006) on gifted students learning environment preferences, dim lighting was preferred by 71.6% of participants, with strong preferences for dim lighting by 35% of participants   This type of data should be taken into consideration when determining lighting schemes for the media center. While a survey may be ideal in determining the preferences of the students at a given school, surveys are time and effort intensive, and will likely result in split opinions, with some students opting for bright lighting and other students opting for dim lighting. Media centers can facilitate both learning styles by providing for dim lighting by installing permanent electric lights and supplementing that light with windows or lamps. Using windows to light the room is called "daylighting." This is a very cheap, easy way to add some extra light to a media center (Kennedy, 2002b). Since glare can cause problems, daylighting is best accomplished (for school media centers in the northern hemisphere) through windows that face north. This eliminates the glare caused by the rising and

setting of the sun in the east and west, as well as minimizing solar heat gain from windows that face south (Jacobs & Sargo, 2005).

Providing blinds or curtains for windows will allow the media center to be "darkened" when film or computer presentations require low-light environments. Curtains can also provide a touch of color to the media center. If a school media center is located in an area that has more cloudy or rainy weather than sunshine, desk or floor lamps may be the way to provide the extra lighting. Lamps can be simple or decorative, but must be purposefully placed to facilitate the uses intended for each space in the media center. A floor lamp by the circulation desk may not be helpful, but could be beneficial to leisure readers in a lounge area. Desk lamps are better utilized in single-study areas than at computer desks.

Regardless of the type of light used in a media center, there are some points that were agreed upon by lighting experts as long ago as 1970. All areas of a school media center should be provided with an acceptable level of lighting, leaving no dark corners or aisles in the stacks. Whatever kind of lighting is provided in a school media center should be diffused lighting and not direct in order to reduce the chance for glare. As pointed out earlier, daylighting cannot be relied upon as an exclusive source of light due to the uncontrollability of the weather (Kaula, 1970). School media centers should also avoid highly polished surfaces (tile floors and polished tables) due to their high reflectivity and increased glare potential (Morris, 2004). Controls for light should allow for dimming of lights within specified sections. There should be light switches or panels for each space within the media center that may need to be isolated. These switches

should be conveniently located by doors and/ or near the section they control (Hart, 2006).

Acoustics and Sound

"Shhhh! You are in the library!" In the past, libraries were expected to provide silence for studying patrons. This need was accommodated for by many libraries incorporating lounges within which silence was not required (Kaula, 1970). While the idea of libraries as quiet places used to be the norm, and may still be in some settings, school media centers should not be silent. Students and teachers must communicate to facilitate learning. While the walls, floor, and ceiling may already be permanently in place, acoustics can still be improved for maximum usage of the media center space. Media centers host a variety of functions. It is necessary for the space to accommodate differing sound levels, and buffer sounds when necessary.

To begin to think about acoustics in the media center, first think about the levels of sound the media center currently attains. Is it ever completely silent? Are there ventilation systems or computers running that are overly loud? Can students hear cars/ trains/ planes during their study times? Can guest speakers be heard from the back row of a large group? Do the speakers from the viewing area overpower students on the computer with headphones? Can small groups collaborating in one area hear each other over the other activities in the media center? Depending on the answers to these questions, the media center may need to rethink its acoustics.

In 2002, Mike Kennedy (2002a) wrote a brief article discussing the possibility of new acoustical standards for educational facilities. These standards were adopted, and can be found in summary at http://www.acoustics.com/ansi_education.asp. This website

provides guidelines in terms of decibels and other acoustical measurements, and offers some suggestions for building an educational facility that meets the new standards. While the standards have been officially adopted by the Acoustical Society of America, there is currently no testing of educational facilities to enforce the standards. For the full set of standards, you can visit the Acoustical Society of America's online store and download a free copy (Acoustics.com" 2003). While the standards were created with classrooms in mind, they should be considered when designing a school media center, as well, since it is a key learning environment in most schools.

Some things to keep in mind when looking at media center acoustics are the surfaces (walls, ceiling, and floor), as well as the arrangement of the furniture, and the location of the media center in relation to the parking/ bus/ road areas on the school campus (Wetherill, 2002). If all the walls, the ceiling, and the floor are composed of hard, noise reflecting surfaces, echoing is likely to increase and become a significant problem. This can be combated by adding acoustic ceiling tiles in place of traditional tiles, or incorporating fabric-covered fiberglass panels in the ceiling, or on the walls. Another way to keep sounds from travelling as freely in a school media center is to place furniture and shelving in strategic locations that will block sound waves and help prevent noise (Morris, 2004). Placing study desks or tables away from the high-traffic or louder areas of the media center (front door, computer area, or circulation area) will help decrease the noise overflow in the study area. If the media center has one or more walls facing the bus lot or a well-traveled roadway, consider adding extra noise barriers such as fabric wall hangings or curtains on windows to those walls to diminish the transference of sound from outside.

There will be times when instruction will be taking place in the media center, and at these times, sound must be able to travel freely in the instructional area. Many times, instruction is taking place in the largest open area in the media center, and this will help with the transmission of instructional sounds. The recommendations above will help eliminate extraneous noises and echoes. As Crawford said in *Library Space, The Next Frontier*, "Librarians should not be in the shushing business" (Crawford, 1999). If your media center has a quiet study area as well as an instructional area, the spaces should be distinctly separated to facilitate the best acoustic situation possible.

In order to support all learning styles in a media center, media specialists should attempt to differentiate the space to allow students to choose between quiet study areas and group study areas that allow for slightly higher volumes. If there is no way to differentiate the space, consider purchasing a few sets of noise cancelling headphones for students who prefer silence when they study. The study of gifted students learning preferences shows that almost as many students prefer sound in their learning environment as those that prefer quiet in their learning environment (Rayneri et al., 2006). The media center should be prepared to provide either learning environment for students, as there will likely be varied preferences in any given school.

Furniture

Another important aspect of the space in school media centers is the furniture. Depending on the age (and corresponding size) of the students in the school, furniture should be arranged and scaled differently. Students' learning styles may also affect the type and size of furniture placed in the media center. Another factor to consider when buying or arranging furniture is the various uses of the media center space. Will there be

a lecture/ large group working area? Will this area be subdivided for small group work,
or is there a separate space for that? Is there an open area where students can move
around, perform, or play? Can the computer space be used for anything else, or is it
single purpose?

Learning styles should be accounted for when arranging a school media center.
There should be comfortable, relaxed areas where students can sit or sprawl on the floor
with beanbags or cushions to read, as well as areas with tables and chairs for students to
sit at 'desks' and study. There should be a place or a way for auditory learners to listen to
audio clips without disturbing the other students or to be able to study in quiet areas.
Kinesthetic learners should have a place to move around while they work in groups, or
'put on' a show from a book they are reading. Visual learners should be provided with
plenty of maps, diagrams, and artifacts within the media center.

Many media centers are not arranged in their most productive and appealing
layout. If the first visible thing when walking in the door of the media center is floor-to-
ceiling shelves, as was the case with Lynette Mitchell, it might be wise to reconsider the
floor plan of the media center (Books and bricks, 2002). The media specialists/ assistants
should be able to have a clear line to sight to most, if not all of the media center from
their desk or office. Appropriate sightlines promote student safety, and encourage proper
use of materials through supervision. Student misuse of materials and resources may be
higher in areas that are not easily supervised (Harper, 2007). To create beneficial lines of
sight, reading areas, study areas, and computer areas should be "in front" of the majority
of the shelves. Depending on the location of the desk or office from which the line of
sight is being determined, it may be possible to use shelving to separate some of the

reading or studying areas. The circulation desk often plays an important role in supervision of the media center, as it is nearly always staffed by a media assistant. By locating the circulation desk near the main entrance and exit, it is easier to monitor the materials entering and leaving the media center; sightlines should allow monitoring of the majority of the media center. The visibility needed throughout the media center is, of course, dependent upon the student population and its needs (Klafehn, 2006)

If multiple classes will be in the media center at the same time, multiple "spaces" should be available within the media center. If there are 30 computers in the media center, consider setting 25 up in a "classroom" area that is distinct from the other five computers. These extra computers can be used by individuals for searching the catalogue or general research or word processing while a class is using the computer "classroom." Also consider having a distinct reading area with comfortable seating to encourage students to read for pleasure. Students can read at a table or desk, but it is much more enjoyable to read on a couch or cushioned chair. Tables and chairs should be arranged in such a way that a classroom teacher or teacher-librarian could lead a class, or small groups of students could study on their own.

Computers are a very important part of the school media center in today's world. Not only do computers replace the old Card Catalogues in providing ready access to the collection, they are also used as reference tools, production centers for staff and students, and as administrative tools (Baule, 2007). This variety of uses requires that computers be strategically placed throughout the media center. A computer or two with the reference collection is always helpful. It is also wise to keep a computer or two in the office or behind the circulation desk that only administrators can access. Computers could be

scattered among the stacks or in the entry-way of the media center to facilitate catalogue searching. The largest single group of computers will be used primarily as a student or staff production area or instruction center.

Furniture specifically designed for computers is also importantn. Two very important considerations when choosing computer furniture are power supply and cord/ wire management. A typical desk from 30 years ago has no place for a keyboard, no cutout hole for cords, and no convenient way to reach the outlet on the wall behind the desk. Today, there are huge selections of desks and tables designed for use with computers. Be sure to consider the school's average class size and the number of computers that will be available for "class" use in the media center. If more than one person will be working from the same computer, provide extra table-top space for multiple students (Baule, 2007).

Chairs and tables in the group study and single study areas should have smooth, easy to clean surfaces. This allows for easy maintenance, and may prolong the overall life of the furniture. When choosing chairs and tables, avoid choosing furniture that has stretchers (the bars between the legs). Stretchers are often just used as footrests, and are difficult to clean around. If the media center is often used for community or school-wide functions that require moving the furniture, consider lightweight, stackable chairs (Baule, 2007).

Another consideration when discussing furniture in the school media center is the size of the furniture. While low shelving is useful in high school media centers for allowing better visibility, it is necessary in elementary and middle schools to allow the smaller students physical access. The younger students in an elementary school will not

be tall enough to reach books on the top shelf of many typical shelving units. Shelves can be ordered in a variety of shapes and sizes making it is easy to ensure the students will be able to access the resources comfortably and safely. Size should also be considered for all other furniture in the media center, including the tables, chairs, couches, and the circulation desk (Books and bricks,2002).

Shelf space is a hot topic for discussion in many media centers. While I personally do not believe any media center will ever become a book-free zone, I do concede that more and more non-print resources are becoming available and desirable for use in school media centers. In order to maximize flexible space in the media center, shelves should line a good portion, if not all, of the available wall space. By incorporating shelves on the walls, more floor space is opened up and can be used for tables, desks, computers, or lounge areas. Single-facing wall shelves also help in maximizing the space that could be dedicated to books. Since floor to ceiling shelves are not the ideal, consider locating windows higher in the wall and incorporating shelves below the windows (Klafehn, 2006).

Furniture for an instructional area should be sturdy, and large enough to comfortably instruct at least one class of students at a time. Round tables can limit flexibility, but square or rectangular tables can be put together for large-group work. Selecting adult-sized furniture allows the space to be utilized by faculty and parents comfortably, but should be considered only in middle or high school media centers where students would also be able to comfortably use the adult-sized furniture. Small children in elementary school should be provided with furniture that is appropriate for their size (Klafehn, 2006).

In general, furniture should be comfortable, durable, eye-pleasing and safe (Morris, 2004). Comfortable reading furniture was repeatedly noted as being important to an inviting classroom, and should be a priority in library furniture (Foster-Harrison & Bullock, 1998). In areas of the school media center dedicated to leisure reading (such as the magazine and newspaper area) there should be plenty of comfortable and informal seating. In schools with older students, consider the student population and their desire to study "biology" outside the lab. It may be wise to purchase comfortable chairs that are for individual use instead of loveseats or couches (Baule, 2007). In schools with younger students, consider purchasing large pillows or cushions for the students who prefer to sit on the floor and read (Morris, 2004).

Temperature and Climate

Have you ever seen a cat curled up in a spot of sunlight, taking a catnap? Perhaps even you have curled up in the sun to take a nap before. Have you ever fallen asleep in class because it was too warm? Or shivered so much you couldn't hear what the teacher was saying over your chattering teeth? Then you realize how important climate control is in a learning environment. Jacobs and Sargo (2005) point out that while good air quality and temperature control often goes unnoticed, bad air quality and poor temperature control will not only be noticed, but it may negatively impact student performance. If you have ever noticed a damp, musty smell in a library, then you also realize how important humidity control is in a library. These are two major issues that must be considered when evaluating or planning a school media center.

Since the invention of air conditioning, libraries have evaluated the benefits and drawbacks of incorporating this amenity. Today, most people assume "air conditioning" means cooling the air to a comfortable temperature, but there are many more benefits to creating an air flow system within a building that houses print resources. Eight air quality factors are discussed in *Library Buildings: Planning and Design*, including temperature, humidity, air motion, air distribution, dust, bacteria, odors, and toxic gasses (Kaula, 1970). Most of these factors are addressed in every modern building's air circulation/ filtration/ heating/ cooling system.

The Rayneri, Gerber and Wiley (2006) study surveyed gifted students preferences for temperature in their learning environment. The results were nearly evenly split between preferring warm and cool environments, with a slight preference towards warm environments (58.7%). For student learning styles to be supported, the best idea is to keep the temperature of the room slightly cooler than warmer. Students can always bring a sweater or jacket with them to the media center if they are too cool without it. It is more difficult for students who are too warm in the media center to cool off. The cooler temperature in the media center may also facilitate easier cooling of the computers being utilized. Tables near windows can also provide "warm spots" to study, for students who prefer warmer areas. If temperatures become excessively warm in the media center during late spring or early fall, consider bringing in mobile fans.

A study completed in 1998 asked students, parents, and teachers what the most important characteristics of an "inviting" classroom environment was (Foster-Harrison & Bullock, 1998). Manual temperature control was identified by teachers as the number one factor in classroom comfort. Students and parents agreed that comfort was the most

important characteristic of an inviting classroom, and temperature control was noted as being one of many important factors of comfort (Foster-Harrison & Bullock, 1998).

To determine what to set the thermostat to, you should not only consider student learning preferences, but also the materials housed in the media center. Paper disintegrates over time and is susceptible to mold in humid environments. Most modern heating and cooling systems can be programmed to maintain a constant temperature, and some can even control for humidity. The ideal environment for preserving paper has a temperature between 70 and 75 degrees Fahrenheit and a relative humidity of 50% (Kaula, 1970). This is a comfortable temperature for most people, and should be manageable for a school media center. If a school media center is in an older facility that has been struggling with humidity problems, consider purchasing and using humidifiers or dehumidifiers. There are many products available that function as both humidifiers and dehumidifiers. When evaluating the school media center's heating and cooling system, also consider the placement of the in- and out-flow vents. They should be located in areas that allow for maximum flexibility of design, as well as places that do not limit shelf space (Morris, 2004). Windows in a school media center should be able to be opened to allow for air flow when the heating/ cooling system is not able to be used (Hart, 2006).

Color

Hospitals are notorious for being sparkling white. Other institutional places also tend towards bright white interiors. School media centers should not be so bland. Colors should be included in the media center. School colors are a good place to begin, though

this should not be a limiting factor. Walls that are not covered with bookshelves or windows should incorporate color, even if it is only a painted border or a bulletin board. According to the 1998 study on creating inviting classroom environments, "The physical environment of a school and its classrooms plays an important part in the support and ownership that a community will feel toward the school." (Foster-Harrison & Bullock, 1998) As the media center often plays host to community events, it is important to consider its physical environment!

A number of studies have investigated the effect of color on attitude and emotion. A1998 study brought together several key findings. Posters, pictures, and plants provide color to learning environments, and these elements have been associated with higher student achievement (Rutter, Maughan, Mortimore,, 1998; Ouston 1979). Cool colors such as blues and greens help students relax, while warm colors such as reds and oranges tend to support anxiety in students (Weinstein 1981). Most teachers and students noted that the use of color on the walls was an important characteristic of an inviting classroom (Foster-Harrison & Bullock, 1998).

As students and teachers are primary users in the school media center, it seems appropriate that media centers should strive to accommodate their preferences for color. To "warm" the media center, use yellows and rich browns in carpets or furniture. To "cool" the media center, use blues, greens, pale neutrals, or white on the walls and furniture (Hathaway 1983;(Foster-Harrison & Bullock, 1998). If there is a large, open wall area, media specialists may consider asking local artists or a group of students to paint a mural. Other ways to incorporate color include plants, posters, student work

displays, drapes/ curtains for windows, rugs, or wall trimmings and borders (Foster-Harrison & Bullock, 1998).

Some things to avoid when incorporating color are overuse of a color, "popular" colors, and large amounts of exceptionally bright colors. If you paint all open wall space blue, even if it is a muted shade, you may eventually begin to feel like you are under water. Add colors in areas—perhaps use blue on one wall and a complimentary green on another wall. Whatever color is decided upon, do not choose popular decorating colors (remember avocado refrigerators?). Instead, stick with a general color palette or school colors. Popular colors will eventually go out of style, and the next generation of students (and teachers/ librarians) will "date" the library. Using bright colors, or even a single bright color, can stimulate the mind, and promote creativity. An entire wall of bright yellow or orange may be too much stimulation. Bright colors are better used for accents and borders in an area such as the school media center.

For elementary students, it is appropriate to incorporate the primary colors of red, blue, and yellow into the media center in measured amounts. Middle or high school students are better focused in green, blue, grey, or beige surroundings (Morris, 2004). Variety is important in choosing and applying colors, but be sure that the colors in your media center do not clash or imply something you do not intend (green and red may look like Christmas decorations or watermelon, oranges and reds may look like fire, pinks and blues may look like a nursery).

An Evaluation of Five School Library Media Center Facilities

In this section of the paper, I present the results of an evaluation of five school library media centers I undertook to determine how well they incorporated lighting, acoustics or sound, furniture, climate, and color into their design and layout.

Sample Selection and Data Collection

The five schools were selected based on ease of access, and included 2 elementary, 1 middle, and 1 high schools, as well as one grade 6-12 school. The media specialists and assistants at each school were contacted via email to determine if they would be interested in participating in the study. Participation in the study involved allowing me to examine their facility and taking part in a short interview. Once the participants had indicated via email that they would be interested in joining the study, I scheduled a time to meet with them face to face.

Upon arrival at each media center, I first examined the media center to determine how well it reflected each of the key aspects. A rubric, shown in figure 1, was used to guide the analysis. A score for each element was calculated by adding the number of criteria met within each category. Each school's category scores were combined to give an "observation score" for the school.

Lighting scores were calculated by observing whether or not the facility's lighting could be adjusted for partial lighting, either by multiple banks of lights and/ or by pulling shades on windows; whether or not the facility's lighting could be adjusted properly for presentations or films; whether or not the facility had natural light; whether or not computers were situated in an area with high glare; and whether or not the facility had dark corners or aisles that were not illuminated by natural or artificial light sources

FIGURE 1. Rubric for Evaluating Media Facilities

Lighting (out of 5)
- ☐ Can be adjusted for partial lighting
- ☐ Can be adjusted for films/ projector viewing
- ☐ Has Natural Lighting
- ☐ Installed to avoid glare in computer areas
- ☐ No dark corners/ aisles

Acoustics (out of 5)
- ☐ Can not hear excessive outside noise
- ☐ Personal conversations do not carry
- ☐ Teachers can be heard during instruction
- ☐ A quiet study area exists
- ☐ Sound-dampening items are used (carpet, wall coverings, acoustical ceiling tiles)

Color (out of 5)
*Color includes shades of red, orange, yellow, green, blue, and purple. Black, white or beige do not count towards "color."

- ☐ Walls incorporate color via paint or art
- ☐ Floor incorporates color via tiles or carpet
- ☐ Furniture matches the color scheme in the media center
- ☐ More than one color is used to decorate the media center
- ☐ Colors are soothing to the eye (shades of blue, green, or purple)
- ☐ -1 if colors are **all** bright, harsh (shades of red, orange, or yellow)

Furniture (out of 5)
- ☐ Appropriate size
- ☐ Sturdy
- ☐ Can be re-arranged when needed
- ☐ Suited to the uses of the media center
- ☐ Chairs, tables, desks, and shelves are in the same style

Climate (out of 5)
- ☐ Temperature can be adjusted on site
- ☐ Climate system controls for humidity
- ☐ Windows can be opened
- ☐ Windows have shades, blinds, or curtains
- ☐ Climate system is working properly

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Acoustic scores were calculated by observing whether or not noises from outside the media center were audible; whether or not personal conversations carried across the facility; whether teachers could be heard during instructional periods; whether or not there was an area dedicated to quiet or silent study; and whether or not sound-dampening items, such as carpet, wall coverings, and acoustical ceiling tiles were included in the facilities design.

Color scores were calculated by observing the use of color on the walls (paint or art/ posters); the use of color in the flooring (such as carpeting or colored tiles); whether or not the furniture matched the color scheme of the facility; whether or not more than one color was utilized in the color scheme; and whether or not the color(s) utilized were soothing to the eye (greens, blues, or purples). If all colors utilized in the facility were bright or harsh (reds, yellows, and oranges), 1 point was deducted from the color score. "Colors" are defined as shades of red, orange, yellow, green, blue, and purple for the purpose of this study. Black, white, and beige are not being included in the definition of "color."

Furniture scores were calculated by observing whether or not the facility had appropriately sized furniture; whether or not the furniture was sturdy; whether or not the furniture could be re-arranged as needed; whether or not it was suited to the uses of the media center; and whether or not the chairs, tables, desks, and shelves were in the same style.

The climate score was calculated by observing whether or not the temperature could be adjusted on site; whether or not there was a control for humidity; whether or not

the windows could be opened; whether or not the windows has shades, blinds, or curtains; and whether or not the system was working properly.

The interviews were conducted in each media center, thus allowing the media specialist to indicate objects/ areas/ characteristics as they were being described. Interviewees scored their facility on the five indicators using a Likert scale, with 1 being "not at all" and 5 being "exceptional." (See Figure 2) Specialist's comments about each score they assigned to the media center were also recorded during the interview. Each school's category scores were combined to give an "interview score" for the school.

FIGURE 2. Interview Questions and Likert Scale

1= Not at all   and   5= Exceptional

1. The current media center adequately fulfills the needs of the school. (1-5)
   comments
2. The overall lighting is appropriate for the uses of the media center. (1-5)
   comments
3. The overall acoustics are appropriate for the uses of the media center. (1-5)
   comments
4. The furniture is appropriate for the uses of the media center. (1-5)
   comments
5. The climate control system maintains acceptable levels of temperature and humidity. (1-5)
   comments
6. Color is used appropriately throughout the media center. (1-5)
   comments
7. The space is maximized for functionality. (1-5)
   comments

During the interview phase, each specialist was also asked to score their facility on how well they believed the facility met the needs of the users, and how well they believed the space in the facility was being utlized. The two questions were assigned a

value between 1 and 5 using the same Likert scale shown in Figure 2. I used these two scores to assign a value (as a %) to the specialist's opinion of how "good" they believe their facility is, in general.

Once all data had been collected via the rubric and the interview, I averaged the interview score and the observation score to find an overall facility score.

Data Analysis and Discussion

Figure 3 shows each media center's observed score based on the rubric. Most schools scored relatively high in lighting, acoustics, and color. Climate control was the lowest scoring category, with three schools having met only one of the five criteria. The furniture category scored the best out of all the categories, overall.

In the lighting category, it was clear that most schools had prioritized this need. Only one school media center had no windows, and thus, no daylighting. The other schools had plenty of windows, and of the four with windows, only one lacked blinds or curtains to manage light control.

Acoustics were another area that was clearly taken into consideration when the media centers were built. All five schools had carpeting in the media center, though one school had an area that was not carpeted due to high foot traffic, which could cause unnecessary noise problems during high-traffic periods. Only one school had clearly separated areas where independent quiet study could take place while other students were studying in groups, and not necessarily quietly.

Three of the five schools met all the criteria for color. One of the schools incorporated only one color (blue) along with neutrals (white and beige). School 5 did

use more than one color to decorate, but there was a lack of color in the carpet, and on the

walls. The walls were dark brick, and the colors incorporated in the media center were

bright colors—oranges, yellows, and avocado green—not soothing colors.

FIGURE 3. Observation Scores—From Rubric
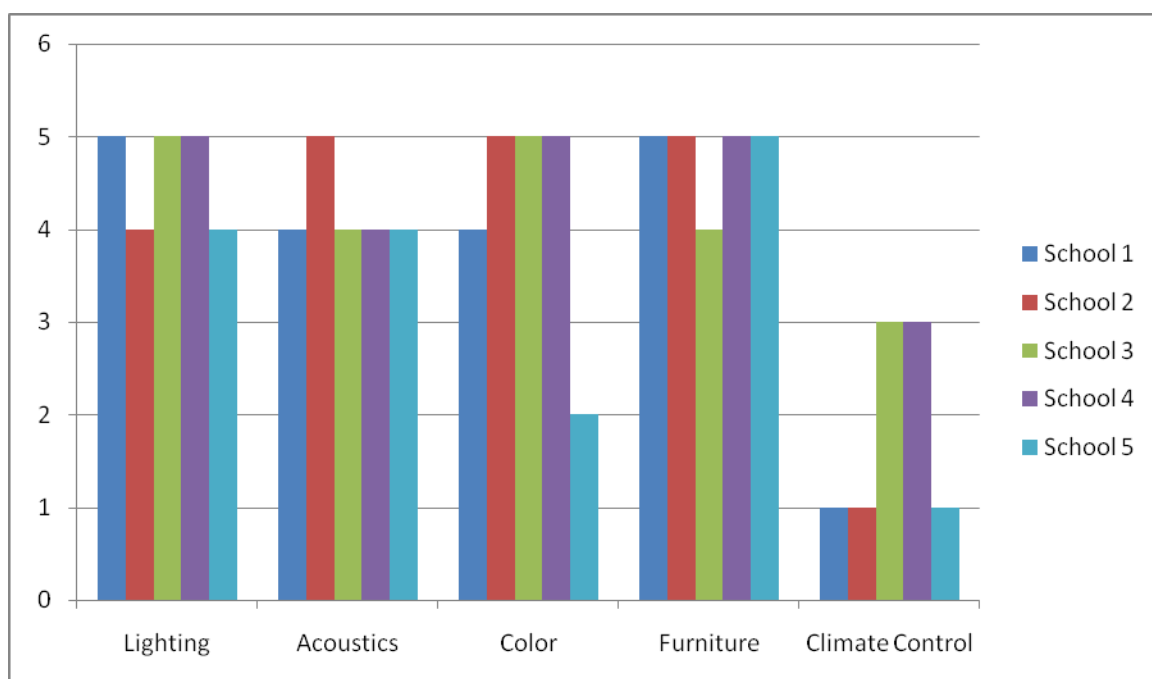
Furniture was the highest scored category in the rubric. Each school had furniture

appropriate to the size and function of its user population. None of the media centers had

completely mismatched furniture, although some did have a piece or two that did not

match the general collection of furniture. Only one of the media centers had furniture

that was lacking stability and sturdiness. Most of the furniture (excluding shelving) could

be re-arranged for special uses.

Climate control was the lowest scored category in the rubric. None of the climate

systems appeared to control for humidity. Of the four schools with windows, two had

windows that appeared to open. Only two schools had blinds or curtains to help reduce

solar heating, when necessary. Two schools of the five had control over the temperature

on-site. One school had fans that could be turned on or off on site, and the second school

that had control of its own climate system had a thermostat that they could monitor and

adjust as needed. The other three schools had climate control systems maintained by the

county or district, and were unable to directly affect the temperature beyond opening

windows.

Figure 4 shows the interview scores. The media specialists seemed quite hesitant

to assign a five to many categories, and none of the specialists assigned more than one

five during the interview. Most specialists scored their media centers at average or above

average, with two exceptions in the climate category and one exception in the furniture

category. When given a chance to comment on the score they assigned, most media

specialists described why the category did not receive a five.

Several problems were mentioned during the discussion on lighting. These include and

inability to block natural light well enough for PowerPoint, film, or other projection

needs; lack of natural light altogether; technology concerns with automatic light

adjustments; and stacks that were too tall and blocked light sources to some shelf areas,

making it difficult to read book spines. The projection lighting problem is a difficult one.

The windows letting the daylight in were often high on the wall, above shelving. It

would not be feasible to install normal shades or blinds in these windows, and electrically

controlled shades are cost prohibitive at this point. Without actual windows in the media

center, specialists can not use daylighting to help brighten the place. The lighting issue in

the stacks is easier to fix than some other problems, though it would still require a

significant renovation. This issue could be fixed by either installing more lights in the

area where the stacks are located, or ordering and installing lower shelving, letting more light scatter and cause fewer (smaller) shadows. The extra lights would probably be the simplest and most cost effective fix for this problem.

During the acoustics discussion, the main concern was echoes from adjoining hallways, stairways, or arches/ high ceilings within the media center. One of the schools had recently installed a new drop ceiling, and the specialist reflected this had helped with overall sound level. Another specialist noted that though their media center was designed with a beautiful arched ceiling, the acoustics were not a problem. The arched ceiling did produce some echoes, but since the instruction areas were not under the arch, and the media center included technology to help facilitate projection of intentional sound (microphones, speakers), the media specialist had no significant complaints about that (otherwise beautiful) feature. A third specialist commented that the main echo problem was from a nearby stairwell that projected all noises into the media center when the door to the stairs was open. As this stairwell is used for class changes throughout the day, the echo problem is persistent, and largely unavoidable. While only one of the five schools had a separate area that could be used for truly silent study, none of the other schools indicated that this seemed to be a problem. Specialists commented that while the media center was never silent, they had received no complaints about the noise level that prevailed within the media center from its users.

FIGURE 4. Interview Scores—from Likert Scale questions
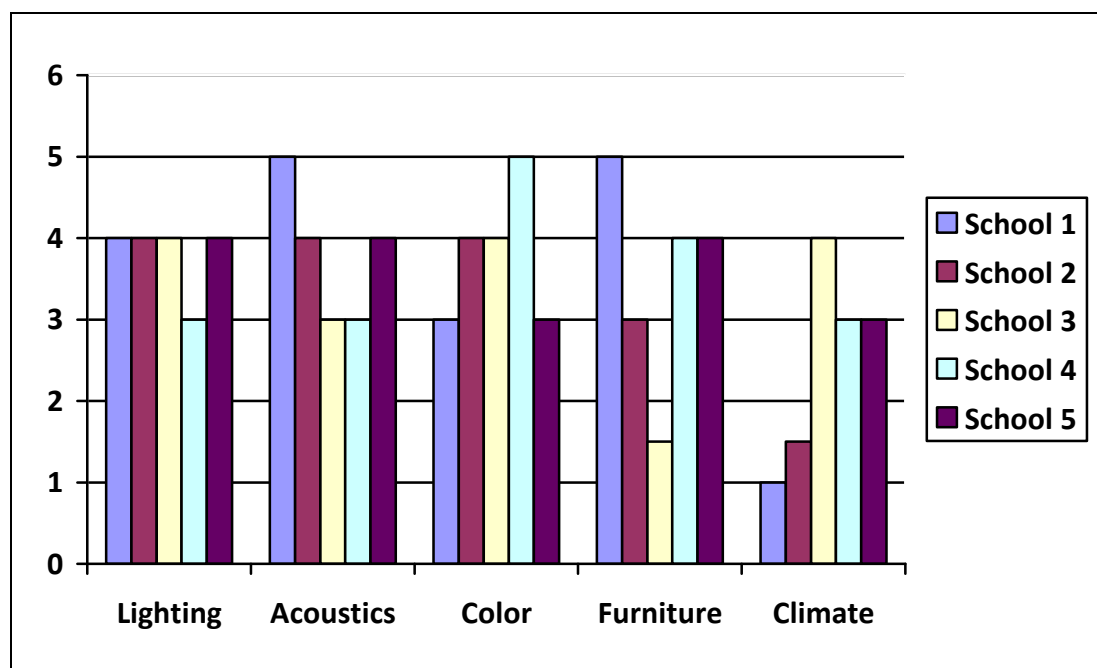
The discussion about color was an interesting one. Four of the five media centers incorporated blue into their color scheme, and had one or more neutrals to accompany the blue. Other color was added via artwork or posters in most cases. The only school without a blue theme in the media center was had been built and decorated in a past era with red-orange, avocado green, and banana yellow. However, the media specialist at this school has used the "funky" colors to an advantage: any displays or decorations set up in the media center match something, and the displays change often. The bright colors in the media center are toned down by the exposed brick and dark wood paneling, preventing it from being overwhelming. None of the media specialists had a choice in the color scheme of the library. Most of the specialists commented that the administration had chosen the colors for the media center, without specialist input.

The schools that chose to participate have a wide range of "ages." One of the schools has been open less than one year while others have been around for decades.

Understandably, older schools may have older furniture. This has distinct advantages and disadvantages. Much of the "old" furniture is actually sturdier than today's, as it tended to be made of heavy wood, instead of aluminum or plastics that are more easily damaged. One media specialist commented that when new furniture was to be purchased, the salesman looked at the current furniture and told the specialist that no furniture in his sales book would be as sturdy and durable as what was already in place. Needless to say, that media specialist kept the "old" furniture. One school specialist commented that they had been repairing the furniture on a regular basis, as legs kept coming loose and funding was not currently available to replace all the furniture in the media center. This specialist did comment that the furniture met the users' needs; it just needed some physical improvements. Another specialist commented that the "rocking" chairs in the media center helped the students stay focused while at the tables in groups. The "rocking" chairs have two angled sled runner sections along with a larger flat runner section instead of one single flat runner. This allows the students to "rock" in their seats.

Several of the specialists commented that they had not been included in the selection of the furniture in the media center. Some of these were cases where the media center had been opened many years before the current media specialists was hired, and other situations seemed to be that the administration picked the furniture without consulting the specialists, but allowed the specialist to arrange the furniture in the space. One media specialist commented that money could have been saved if the administration had asked the specialist what furniture was needed for the facility. At two schools, after the furniture was delivered, several pieces of furniture bought specifically for the media center were dispersed to other departments, as they were not useful in the media center.

Each media specialist interviewed commented that the mobility of the tables and other small furniture was beneficial.

Climate control was the lowest scored area during the interviews. Only one school claimed "above average" climate control. The other schools had a variety of difficulties with climate control. The most common concern was that the thermostat was actually controlled by the district of the county, and that media facilities had no direct control over the temperature. None of the systems controlled for humidity. One school had a serious humidity problem when the school was opened. Since the climate system was not functioning properly, the humidity in the media center was extremely high, and book pages were becoming wavy, or curvy, with the moisture. Even with dehumidifiers, emptied daily, the humidity was a problem on weekends, when the dehumidifiers would overflow. Fortunately, this was fixed with all due haste, and there have not been further humidity problems in that media center. One school rescued some old ceiling fans from a school that was being renovated, and installed them in their media center in order to have some local control over the temperature. In one of the older schools, the climate system has been a long-standing problem, causing health concerns with bad air quality and circulation. One of the newer school's climate systems is unbalanced. Of the two main air ducts in the media center, one disperses cool air and the other disperses warm air, effectively creating a cold side and a hot side to the facility. In the schools with windows, specialists commented they use the windows to help air flow and control temperature.

When asked to score their facility on how well it met the needs of the users, and how well the space was being maximized in its usage, the specialists were again hesitant

to score their facility at an "excellent" level, however, but most of the specialists declared

their space to be above average in meeting user needs and maximizing space. Overall

quality scores ranged from 67.5% to 90%. The Quality Score (Figure 5), based on

specialists' opinions of their facility, can be compared to the Facility Score (Figure 6),

which is a percentage that represents how well the facility lines up with criteria for

"good" facilities as found in literature.

FIGURE 5. Quality Facility Score (%)—from Likert Scale Questions
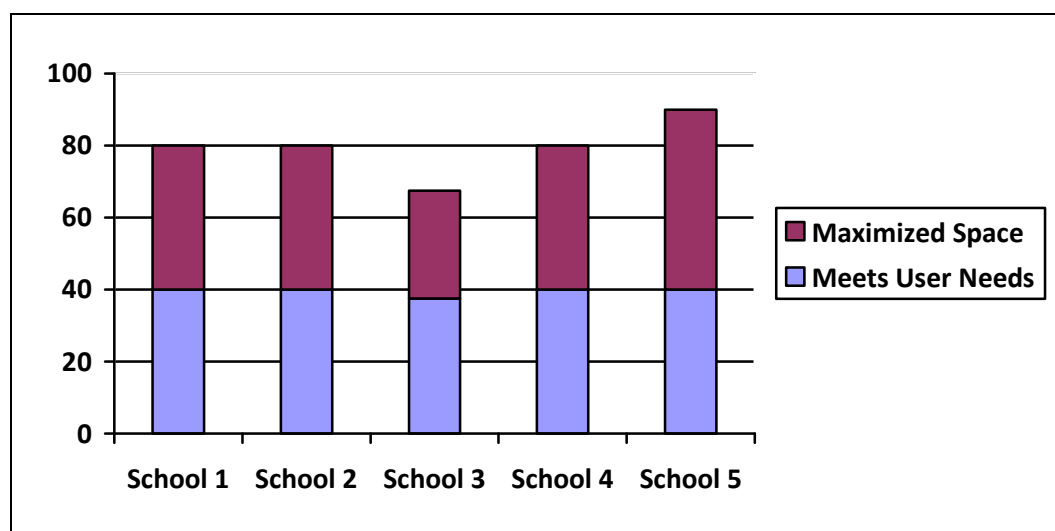
The data in Figure 6 shows the averaged scores from the rubric and the interview,

using the 5 category scores from the rubric and 5 interview question Likert values (from

the questions on lighting acoustics, furniture, color, and climate).

FIGURE 6. Facility Score (%)— Averaged from Rubric and Interview
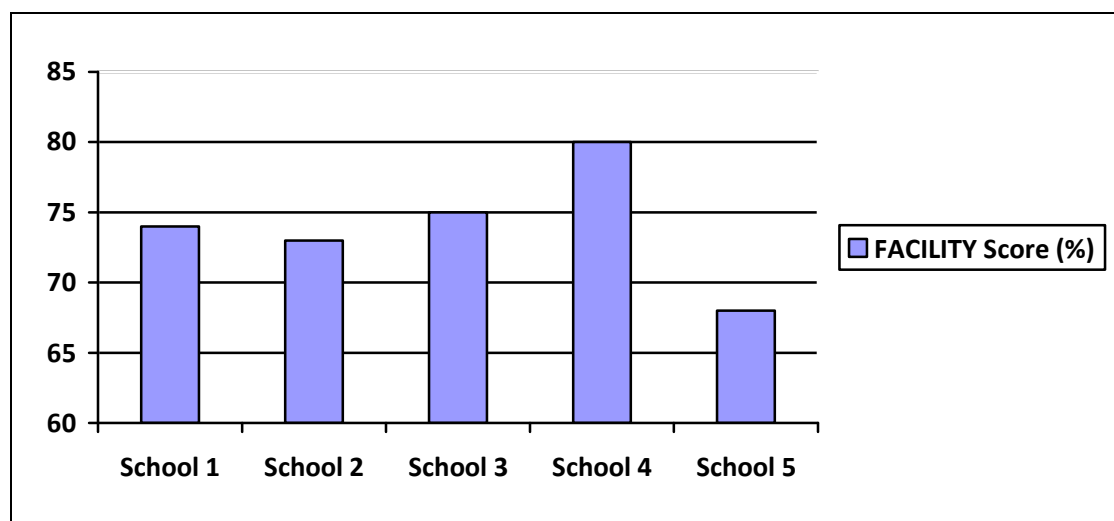
Conclusion

Using the criteria identified by the literature review—lighting, acoustics or sound, furniture style, climate control, and color scheme—the five media centers that chose to participate in this study rate as moderately "good" facilities. The media specialists too ranked the facilities overall as above average. Four of the five schools had Quality Scores within 10% of the Facility Score.

The criteria used in this study can be applied to any facility to determine how "good" the facility is, but if the facility is older, it is likely that the facility will score low. The newer the facility is, the more likely that current (or much more recent) research was considered in the design. While only two of the schools in the study are less than 10 years old, the others had been renovated since their construction, thus explaining why their scores on each criteria were higher. The largest discrepancy in the scores was between the Quality Score and the Facility Score for School 5, which has only had minor

renovations since its construction. Yet the very criteria that lowered the Facility Score for School 5 (the furniture score) was seen as a benefit by the media specialist. This suggests that a media center facility does not have to be perfect and meet all suggestions and recommendations made in literature to be utilized successfully.

In order for a media center facility to be utilized successfully, media specialists must take into consideration the learning styles of the facility users. During the interview phase, each media specialists acknowledged the fact that students have different learning styles. While there was no specific question about accommodating learning styles, it was evident that the media specialists were aware that the each media center patron is unique and has their own style of learning. However, the media specialists appeared to support the varied learning styles more through technology and programming than through facility design.

While there is no one right or wrong answer for all school media centers, each media specialists should ask themselves the question, "Does my facility meet the needs of my students?" By carefully evaluating their current facility with consideration for lighting, acoustics, furniture, temperature and color, a media specialist can determine which areas need improvement. If funding is limited, media specialists can begin by choosing one area to improve each year until all areas have been redone. Even small improvements in these areas will help students who are studying in the media center.

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