

# **Manchester Academic Charter School**

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## **Introduction**

The Manchester Academic Charter School is interested in enhancing its computer education component because of the increased importance of computer proficiency in our society. Possible extensions in computer education include teaching the hardware components of the computer, beginning programming, as well as web development and publishing, and multi-media development.

John Taylor, the Assistant Director, handles all Computer administration including maintenance, purchase, repair, etc. His capabilities range from software installation to diagnosis of software and hardware problems. In no regards does he consider himself a computer guru but he has the skills to figure out what needs to be done for the computers to keep them in good repair. Mr. Taylor has been with the school for about one year. He recognizes that his organization is lacking in computer literacy and training. Before his arrival all computers were taken out for servicing. Currently the computer lab is staffed by a full-time teacher who coordinates computer supplements to the standard curriculum. The music teacher is the only other teacher with computer competency which Mr. Taylor sees this as a problem and would like to change it. In order to bring the school to the technology forefront he recognized the need to obtain more information and increase his knowledge of computers in our society. From this understanding I was able to help direct his learning to augment his job in leading the school in a positive and innovative direction for the students and the community.

The Manchester Academic Charter School has many issues to address as it moves forward with its aggressive implementation of computer usage in its curriculum. Mr. Taylor has the non-trivial task of coordinating this effort while also maintaining the schools level of academic excellence, overseeing future expansion of the physical facilities as well as expansion of the student body to K-8. After thorough observation, thought, and discussion I found that Mr. Taylor's experience and enthusiasm would allow us to accomplish a large area of computer content and will leave him with greatly enhanced computer competency. The overarching goal for the experience was to give Mr. Taylor the tools necessary to easily evaluate his computer systems and plan for future hardware enhancement, plan curricula, and oversee teacher and staff training. The focus of the consultant work dealt with expanding Mr. Taylor's fundamental understanding of computer and network configuration, basic Internet development, and developing a sample computer curriculum for his students.

## **Situational Analysis**

The Manchester Academic Charter School (MACS) is an elementary school located in the Manchester section of Pittsburgh, PA which offers an alternative to standard public school education. MACS focuses on offering a community oriented education experience for its students, which includes a strong parental participation component. Its mission is to provide a quality education to students of grades K-6 which will enable them to become life-long learners. Their education is greatly enhanced by a greater number of people involved in their tutelage, the

business community, institutions of higher learning and the community at large. MACS has approximately 125 students, 19 full-time staff members, 2 part-time employees, and a budget of approximately 1.3 million dollars. The school is governed by a Board of Directors and is charter through the Pennsylvania Department of Education.

MACS is in the first year of a 3-year charter through the state of Pennsylvania. The school has been in existence as a privately funded institution for 18 years and was founded by a couple (an educator and a minister) who saw a need in their community for a more interactive style of education. It was one of the first publicly charter schools in the Pittsburgh area and during the next 2 years the organization plans to expand from K-6 to K-8.

The Manchester Academic Charter School is a full service elementary school which operates from 8:30am – 3:30pm, Monday - Friday. The curriculum includes the basics: reading, writing, and arithmetic, as well as science, art, music, social studies, and physical education. Computers are used as a tool to enhance the learning experience in all subjects. MACS has made computer education a priority; each student spends at least 30 minutes at a computer a day. In the younger grades the computer is used as an aid for basic skills and learning (reading and math). Older grades begin to use the computer for more in depth reference use. Currently research for the older grades is limited because of a lack of Internet access. There is only one computer equipped with a modem connecting through the principal's AOL account

The Manchester Academic Charter School currently shares facilities with the Manchester Youth Development Center (MYDC). The building is fully utilized seven days a week by the school and a multitude of other community programs including a pre-school, elementary and high school after school programs, as well as sporting events. The building is 30 years old but has been renovated to support the school space needed. An addition was added to the facility five years ago that approximately doubled the usable space. Currently the building has a gym, multi-purpose room/cafeteria, art and music rooms, a small library, computer lab, 10 classrooms, a small dance studio and recreation area, as well as administrative office space for both MACS and MYDC.

The Manchester Academic Charter School has twenty-one staff members. The school administration consists of two individuals, a Director and an Assistant Director. The director is one of the founders and the assistant director, John Taylor, is the community partner for this project. Teachers of kindergarten through third grades teach self-contained classes – a single teacher for most subjects. Grades four through six rotate teachers to cover subjects of reading, math, science, Spanish, art, music, physical education, and technology teachers. In addition to the teachers and administrators there are three teacher aides, one receptionist, one pupil personnel employee, and one secretary. Current a concern of the Assistant Director is the lack of computer proficiency of the staff. The teachers don't have the computer skills needed to integrate computers deeper into the curriculum. He would like to arrange training for them to in the future.

The administration has actively solicited computer donations and has bought many over the years. The school computer lab is made up of 10 Compaq Presario 7750s that are 4 - 5 years old. They are not networked and are running Windows 95 on 8 Megabytes of RAM and 1.0 Gigabyte hard drives. Over the past year ten brand new Compaq Presario 2256s were purchased. Their distribution through the building is as follows: 2 in the administrators' offices, 1 in the library, 1

in the computer lab, 4 in the science classroom, 1 in the art room, and 1 in the social studies room. The school current has 12 printers – 5 Hewlett Packard HP 6Ls which are new and 7 Canon Bubble Jet BL6250s three of which are new this year. Additionally the school has inherited 2 new scanners and has a digital camera.

## **Problems and Possibilities**

Over the past several months 20 computers have been donated. Ten of the computers are relatively new Pentium level machines given to MACS by Westinghouse. These machines are 90 MHz computers equipped with AT motherboards and cases, video and Ethernet cards, 16 MB RAM, 16X CDROM Drives, 3.5in floppy drives, as well as monitors, keyboards, and mice. These machines didn't have hard drives but were highly upgradable. The Cigna Corp. donated 10 486 Intel Processor computers equipped with 341.2 MB hard drives, Ethernet cards, 8 MB of RAM, as well as monitors, keyboards, and mice. These computers aren't very upgradable but work fairly well. These computers needed to be brought up to working condition to be put into service in the school community. These computers can potentially go in several classrooms and a few may go home with kids who have special needs.

Most of the computers in use are under warrantee with CompUSA. Mr. Taylor takes computers to the store to be repaired when needed. The warrantee doesn't cover all work; CompUSA charges \$90 to reload software for example. In addition to the warrantee a repairman comes in about once a week to fix computers. This person is expensive but is necessary to insure the computers run as smoothly as possible. John wanted to have more control over the computers in the school which required him learn more about what a computer is composed of and how the parts work to produce what is seen on the displays and printouts. This was expanded to be able to effectively plan for future computer infrastructure expansion. Mr. Taylor recognized that he would need a greater background to bring the school forward in its technology deployment.

A second issue is the teachers' technology training and preparedness. Recently a faculty member infected eight of the computers with a virus that caused severe damage to the systems. A future possibility is training the teachers to do basic trouble shooting and safe usage practices. Overall the management of the computers at MACS is not a problem. No major incidents have come up that couldn't be handled. Mr. Taylor would like to learn more about computer hardware for his own knowledge and to develop a computer hardware component to the curriculum.

## **Scope of Work**

Mr. Taylor came into the partnership with a mastery of the basic mechanics of computing and a firm grasp of many office applications. A self admitted weakness in his training was that he didn't understand the technology that made computers possible. This deficiency became apparent with the example of the multitude of donated computers the school has received. Several sources have given MACS computers of varying age but Mr. Taylor was not sure how to determine what was given to him, their upgrade ability, and what needed to be done to make them operational. As principal he may not have to do the physical work but he does need to ensure its completion. By acquiring the skills necessary to do this type of computer evaluation Mr. Taylor would be

able to speak to computer technicians, salespeople, and specialist with the ability to articulate his needs.

One of the major goals Mr. Taylor has for the Manchester Academic Charter School is to create a computer curriculum for the students that will allow them to excel in our information driven society. His major effort is to give the students the gift of computer literacy that is unable to be learned in many circumstances in the home environment. Mr. Taylor would love to get feedback on what he's already begun and to gain assistance in expanding it much further. He wanted to use me as a computer student/teacher to exchange ideas; methods I've found useful, and a source for other contacts which might help him bring this curriculum to MACS. This goal is not focused on immediate gratification. My role would be as a valued assistant and any help given would be appreciated. Under ideal circumstances Mr. Taylor would like for me to return next semester to continue working, testing, and doing research on this major project of his.

Mr. Taylor had written a draft of a curriculum which was completed for a Masters Degree class at Duquesne University. He was interest in extending it with the knowledge he'd obtain with me and then some. As stands the document covers the birth of computers covering a short glance at the ENIAC and other early developments. It then skips into the rudimentary components of the computer and goes over several lessons on them. Planned expansions include web development/publishing, greater depth of the components inside the computer and basic networking. Already on top of this he's devising a 6<sup>th</sup> grade curriculum which will have a large web-publishing component. Our work together would aid Mr. Taylor in introducing computers into the core curriculum.

Mr. Taylor's computer hardware training was approached by hands on experience as well as by doing web research and reading to approach both his thirst for hardware training and curriculum development. The first objective was to get at least a few of the donated machines up and running. This is would require us to open up the computers and figure out what is needed in the systems, purchasing the necessary equipment, installing the components, and configuring. This process would be done as a team first opening up the computers and identifying components. As we work together we discussed functionality, upgradability, and other pertinent topics as deemed necessary. When we diagnosed what was needed and Mr. Taylor was then charged with purchasing the required equipment for later assembly. Mr. Taylor was left with the remainder of the computers to upgrade. This project required Mr. Taylor free to up budget money to buy the computer components as well as precious time to learn the some times difficult concepts needed to get machines working. This phase of the his development took approximately 6 weeks to (1) learn the concepts, (2) explore the computers, (3) research components, and (4) assemble a computer.

Concurrently I tried to increase Mr. Taylor's understanding of networking and the development of the Internet. We cover the client/server model, Local and Wide Area Networks, Servers, Routers, etc. Most people don't actually have a grasp of what the Internet is composed of I felt it would benefit him in understand why it changed society. I felt that if we spent a few weeks time learning these concepts Mr. Taylor would be more than ready to conquer networking the school in the future. More importantly he'll be able to begin filtering the content to the students in the form of computer curricula.

This part of the education process was completed through web searching sessions every couple of meetings and discussing what we've found. By both of us doing this together searching different websites for information we both found free resources available to bring knowledge to the staff and students. This part of the training took place during the latter half of the semester in weeks eight through thirteen. This process began with discussions on the origins of the web and what has made it successful, discussions on how it has effected my life and education, as well as what would be needed to bring it to the Manchester community. These discussions quickly evolved into web publishing and development sessions which exposed Mr. Taylor to many different ways the internet can be used in the classroom as well as to highlight the charter school itself.

My goal for Mr. Taylor was to give him a firm foundation in the hardware which allowed computers to operate and expose ways computers are revolutionizing communications and publishing. This two-fold mission was developed directly from his desires to be better equipped to handle maintenance issues as well as give the students and staff the direction needed to be successful in the future. The web was my central teaching tool and was a medium that was absolutely needed to understand the future direction of computers, education, and information distribution.

These two projects, the computer upgrade and the Internet training were planned to give MACS a director who is ready to begin developing an environment ready for the twenty first century. . With this computer knowledge he'd be more than ready to present concepts to his students, teachers, and staff as well as competently plan future computer growth. MACS would gain a computer expert, which it needs for developing and finding people to take the school into the technology age. Mr. Taylor would be able to better evaluate the ways the computers are managed and could possibly save the school a lot of money by doing his own upgrades and repairs or teaching a volunteer to do it.

## **Outcomes**

Over the past three months John Taylor has come a long way in terms of developing his computer management skills. He has gone from simply a computer user to a person who can prepare computers for use as well as begin teaching novices how to become productive users. John has been able to quickly apply his computer hardware training to the improvement of the Manchester Academic Charter School in such ways as future planning of computer infrastructure and upgrades, purchasing parts for computer systems, and dealing with contractors on a more equal level. He has also expanded his understanding of the Internet and is in the process of making it a more active part in the MACS environment and curriculum. Not only has he started to use the World Wide Web for computer research and purchasing but also he's ventured into web-development and will be bringing it to the students, staff, and the community.

Mr. Taylor now has the ability to evaluate computer systems at the component level independent of Windows 95, plan upgrades, purchase the necessary equipment, and either install it himself or have it installed by appropriate individuals. He better understands the roles and functions of items such as sound cards, hard drives, CD ROM drives, and Ethernet cards and how the

interrelate. His mastery of these skills are easily illustrated by the upgrade of the computer systems donated by Westinghouse in early January 1999.

Mr. Taylor was able to explore the conditions of ten 90MHz computers with some assistance, decided on the upgrades he wanted to see in the systems, as well as purchased the necessary parts needed for the job. This activity wasn't only a process of looking at what the computer had but encompassed the evaluation of compatibility issues, research into different brands of components, and the pricing and purchasing of the parts. Mr. Taylor was able to make the transition from having his contractor doing the entire purchase and upgrade job to buying parts from wholesalers on the Internet at reduced rates by himself. He was able to purchase ten new 2.1 gigabyte hard drives from the website [www.pricewatch.com](http://www.pricewatch.com) for \$110 each. An even bigger testament to his growth is that without need to consult me he was able to purchase soundcards for these machines as well at discounted prices.

Mr. Taylor has taken his increased skills to another level by deciding to upgrade the computers in the student computer lab for the 1999-2000 school year. He has been able evaluate where he'd like the computer lab usage to move towards in the future, evaluate the multitude of different upgrade options, and decided on the direction he will take in completing the project. With only limited help by way of questioning me Mr. Taylor has decided to lease ten new computers instead of buying new or upgrading the current computers. He also will be leasing a server and networking these computers. The school has decided to invest in increased Internet bandwidth to support the lab and future Ethernet wiring of the entire school. I consider this a large step forward because has been able to make these decisions independently which is a clear sign of growth over the past few months.

John Taylor has expanded his understanding of the World Wide Web and has taken an interest in learning how to create websites and easily publishing material. He was already comfortable browsing for needed material but he hadn't developed anything of his own. Currently he can create pages using Netscape Composer and has become comfortable porting his written documents to html format. Mr. Taylor can add pictures, links, and edit pictures in a Claris picture editor and publish them. He has progress far enough to begin planning a website for the Manchester Academic Charter School which will feature the mission and goals of the school, Teachers and Staff, the Strategic Plan, Contact Information, Students at Work, a school profile, Collaborative Affiliates, MACS Moments, and links to other sites. Mr. Taylor has already made plans to begin using Microsoft FrontPage once he has mastered the basics of HTML. With his new found understanding of the utility of web development and he will begin porting it to as many areas of the student curriculum as possible.

John Taylor has already illustrated elements of retaining the knowledge he has as well as passing it along to the entire Manchester Academic Charter School Community. Mr. Taylor has already expressed interest in producing a stand-alone computer curriculum, which will place the students on the cutting edge of development early. He already wants to do lessons centering on decomposing a computer to show how it works and now wants to bring web publishing to all the grades. Mr. Taylor has also found someone to help develop and take control of the school website that has the potential of become a central point of communication of work in the school.

I am exceedingly proud of the way Mr. Taylor has been able to address the computer contractor who maintains and upgrades the computers. He now has the ability to go to him and easily speak to him as to what exactly he wants with confidence. The contractor doesn't need to purchase all the materials any more because he knows where he can obtain the best prices. Mr. Taylor has been able to order all the parts needed for the upgrade of the Westinghouse Computers and was easily able to articulate what needed to be. This is a complete role reversal and is a sign that he won't be taken advantage of by consultants, wholesalers, or retainers in the future. His new found knowledge has given him the skills necessary to lead the school in a direction of increased technology.

## **Recommendations**

After being in the Manchester Charter School environment for the past three months and working with Mr. Taylor I know that they are heading on a positive path with the usage of their computers. Mr. Taylor's vision of training the students to be more than just computer literate is obtainable and can be accelerated hopefully with these suggestions. Overall I feel that MACS should concentrate on getting the teachers and staff as well as the kids up to speed on basic computing. It is at the point when all the teachers are comfortable with computers that they can effectively integrated them into the curriculum. I also feel that the Internet can be more effectively used as a communications medium as well as for sources of information on all topics needed for research ranging from computers to basic school curriculum.

MACS would benefit greatly from hiring or training the computer lab teacher in many of the latest applications of computing. Currently the lab is only used for tutorials and games. The usage of this lab can be expanding to web development, simple to advanced programming, creating assignments for different subjects, and much more. This person should be well trained in HTML and different web development tools, Office utility tools such as databases, word processors, spreadsheets, and general to more advanced computer maintenance. This person doesn't necessarily need to have a technical degree but be well versed in computing and trained and/or experienced in teaching computing. It may be difficult to find a person with all these characteristics cost effectively for the school but in the least case scenario sending the computer lab teacher to as much training as possible will benefit the school greatly. This person should become a computing resource for the school and should be able to help everyone build a curriculum using computers.

In order to make the students truly computer savvy everyone in the school should feel comfortable using computers. The teachers, staff, and parents need to be able to see the merits of computing in order for the kids to learn how to use them. The push for computer literacy should be a community effort. The teachers should feel comfortable enough to integrate computer usage into their classes and lessons. In order for this to happen the teachers need to understand how computers can be used. This initiative doesn't have to be limited to the idea, "the teachers need it for the students", but that the community at large will benefit from the increased use. The parents are already a part of the education process from an advisory point of view. If they can gain at least some level of computer knowledge they may be able to use it as an opportunity for a career direction and spark ideas to enter a computer related field. The training of everyone in the MACS environment could aid the school and truly effect the community. The school can act as a

portal where technology can be reached and utilized for life long learning and greatly supplement the school's community atmosphere.

My final recommendation is to pursue corporate and/or academic partnerships with companies, schools, and civic organizations. One of the most important things a partnership can give is not money but technology resources. Computer knowledge is invaluable and a few hours of time are much easier to give than a few hundred dollars in donation. I feel that the exposure to professionals will excite and motivate the students to become the future leaders of our society. Pittsburgh has many budding technology companies that can donate a few hours of to give lessons on HTML, general computer support, or possibly volunteer training. These bonds with industry fall directly into the vision and mission of the Manchester Academic Charter School and will tie the Pittsburgh community together in non-traditional ways. These partnerships don't have to be limited to corporate partners with three large universities in the area. Faculty and student organizations have knowledge resources that can be easily accessible to the students of MACS. These would be relationships that strong role models can be found.

### **Resources**

John Taylor is definitely on his way to creating an environment where learning and computers can be integrated in a sensible manner. The most important concept that should be taken away from this experience is that there is a wealth of knowledge available free to all via the Internet. I feel that it is fitting and most beneficial for Mr. Taylor to properly utilize the web as an information source for many issues. Below I present several web-based resources that will be of use of the staff and the students to begin to learn more about computing and the fast paced technology culture.

1. <http://www.hotwired.com/webmonkey/>

After working with Mr. Taylor all semester I've seen that he has great potential and can learn things very quickly. The Hotwired website sponsored by Wired Magazine is an excellent resource for the budding technology citizen teaching themselves web and computer concepts. Mr. Taylor has shown a great amount of initiative all semester and would need a source like this to keep up with his ever-increasing questions and interests

This site isn't only good for Mr. Taylor but also for the faculty and staff of the school to learn different skills that can be applied to the classroom. I've found that Hotwired is a spectacular site that presents material at a non-demeaning level but highly learnable. This is one of the few web development sites that I've seen and used myself that can satisfy ones computer learning curve so well. This site contains such a wide range of topics from beginning to advance it has something for every level of development.

2. <http://www.pricewatch.com>

John maintains all the computers at MACS and now has jumped into installation of hardware components. He is much more cognitive of the hardware side of computing and should continue

to be familiar with the current prices of needed computer equipment. I suggest [www.pricewatch.com](http://www.pricewatch.com) because he can use it a pricing guide, a purchasing agent, and a general equipment research tool. It's not only a market place for all computer hardware products but it is a great snapshot of what is going on in the technology market. John can use the site as a jumping point to figure out what technologies are becoming available to consumers keep abreast of future expansion of the school infrastructure.

Pricewatch will allow him to be able to estimate the cost of repairs of all equipment. This site will allow him to approach contractors or computer repair people with knowledge of components and their pricing. This added power would save MACS a lot of money from excessive charges. John has already been exposed to the Pricewatch experience and now can see the difference between it and web auctions. This can be used as a benchmarking tool.

3. <http://L2L.ed.psu.edu/>

Link-to-Learn is Governor Tom Ridge's three-year, \$132 million initiative aimed at expanding the use of technology in the classroom, including new and upgraded computers for schools and technology training for teachers. This site is an ideal resource for Mr. Taylor and MACS. This and many of the sites of its type have been created for the sole purpose of educating teacher in technology free of charge. This site in particular offers Technology Tutorials, Classroom Activities, Online Projects, Featured Teachers, Workshop Kits, Leadership & Technology highlights as well as Learning Opportunities. There is a multitude of other sites such as Web66: A K12 World Wide Web Project (<http://web66.coled.umn.edu/>) that is geared to help K-12 Schools set-up web servers in their schools. This will be especially useful next year when lab upgrades will take place. Global Connections Online (<http://www.nsglobalonline.com>) is sponsored by National Semiconductors for teacher education on technology issues.

4. [Www.ctc.org](http://www.ctc.org)

I suggest this site because MACS needs to find organizations in similar positions as itself on a technology end. The biggest resource is from peers who either have gone through the same issues or are going through them as well. This can be a great way to get other curriculum ideas, find out more about different funding options, etc.