An IT Evolution in the Classroom

By J. Cameron Newpher

Auburn Career Center has evolved along with the information technology field to ensure its students are prepared for the 21st century workplace.

Auburn Career Center, the first career and technical center in the state of Ohio, is celebrating its 40th anniversary this year. Over the years, Auburn has opened new doors to unlock the potential of thousands of high school and adult education students through its commitment to excellence in education. The award-winning career center, which is located in Ohio's Concord Township, annually serves approximately 650 high school students within 11 school districts in Lake and Geauga counties, and approximately 3,500 continuing and adult education students.

Auburn has been constantly at the forefront in cutting-edge technology initiatives. Technology is the vehicle, but people make the difference. One person who has been helping this premier learning facility since 1985 to integrate technology with traditional teaching tools is J. Cameron Newpher, Auburn's information technology consultant and president of iTe Consultants located in Painesville, Ohio. G. Thomas Schultz, Auburn's superintendent, has been working directly with Newpher to bring the career center along its technology journey.

Since 1999, Schultz and Newpher, with the support of administrators, board members, faculty, staff, parents, associate school districts and the community, have helped lead the way for Auburn to be recognized as a technology leader in education. In fact, in 2000, Auburn was selected as a national pilot site and the lead school in Ohio for the "Building Linkages in Information Technologies Initiative" sponsored by the United States Department of Education and the National School-to-Work Office. In 2003, the school was also selected as the only school of its kind nationally to be featured on Discovery Channel's "Champions of Industry," a program focusing on the delivery of curriculum and information technology.

According to Schultz, "Auburn has always been a pioneer in regard to incorporating technology into the classroom. By keeping up with the changes and staying on the cutting edge of technology, Auburn better prepares its students for the future and enables them to keep pace with ever-changing technology in the workplace."

It's this kind of forward thinking—along with the school's mission guaranteeing that all students empower themselves, excel in the emerging workplace and enrich their community—that has been the driving force to success.

An Era of Personal Computers in the Classroom

Looking back at the 1980s, technology in the classroom was certainly evolving.

Auburn became one of the first schools in the state to receive and provide training on the new IBM Personal Computers (PCs). This started a new era of technology that would propel Auburn into the future of delivering information technology (IT) in the classroom.

Application software such as Wordstar, WordPerfect, Dbase, and Lotus 123 would allow users of these applications to create documents, databases and spreadsheets on the PC. These documents could be saved, recalled, revised and printed when complete without the use of paper and pencils. This technology put PCs in the workplace, offering new challenges and opportunities for Auburn to provide training on these applications at a very early stage. PCs in the workplace changed the way most organizations would do business, and the need for training on PCs and applications became a new area of business for Auburn.

PC Networking in the Classroom

As the technology proliferated, the need to provide better means of sharing resources between PCs became apparent. A technology enabling PCs to communicate between one another allowed groups of PCs to share resources such as printers, file storage and application software. This technology became known as PC networking and was also the beginning of so-called network infrastructure and network operating systems. Network infrastructure would be the physical means to connect the PCs in a classroom. Very similar to the cable used to connect your televisions, cable was used to connect the PCs. Networking operating systems would provide the services necessary to coordinate multi-user access to applications and shared peripherals.

With the development of PC networking and network operating systems came the term local area network or LAN. The LAN became a global buzz word and, hence, the terms network fileserver, network printer and network client came to fruition. Another new term, client server technology, referred to clients as being the PC, and the server being the workhorse computer or fileserver. The fileserver contained large disk drives, random access memory (RAM), network cards, and supported the networking operating system. All these components combined allowed PCs connected to the LAN to share application software, storage space, queues to service printing requests, and software for user management services.

Auburn Career Center's Technology Learning Center includes a multimedia conference facility with video conferencing and Webcasting capabilities.

Shared Resources in the Classroom

Use of client server technology and networking the PCs in the classroom was the first step to reducing cost in the classroom. Instead of installing application software on each computer in the classroom, a multi-user version of the software would be loaded on the fileserver. This would allow each computer or client in the classroom to load the software from the fileserver over the cable when needed. Information created from the multi-user versions of software could be saved to the network fileserver and printed on networked printers. Print jobs submitted to the network printers would be queued in the order received, allowing the users to continue their work without waiting for the printer to finish its print job.

In the early stages of the PC evolution, only one application could be used at a time. Using network printing freed up the computer to complete other assignments in the classroom. This technology made the classroom more productive by providing more time for the classroom instructors to teach.

Support for Networked Classrooms

Client server technology has been used in most classrooms and the workplace for the last 20 years, but not without its downsides. Using client server technology, the IT department at Auburn was continually faced with updating computers in all the classrooms participating in Auburn's technology programs. Teachers often had to play the role of systems administrator every time a student went beyond his or her means or changed the working parameters of a classroom computer.

Client server technology required a person familiar with fixing the network operating system anytime the server crashed. This would render a PC classroom inoperable until the problem could be resolved. In some instances, the reliability of the network would mandate that each computer be loaded with all software supported in the classroom. This defeated the purpose of PC networking and actually increased the costs in the classroom.

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Rising Costs in the Classroom

Today, IT in the classroom has become even more critical. The PCs now are providing access to information that was unheard of 10 years ago. With the development of Microsoft Windows, users of information technology in the classroom can do many tasks at the same time and share information with individuals across the globe. PCs have become more powerful, users are more sophisticated, and the demand for technology resources has grown significantly. Along with this growth has come a rise in costs to support the technology.

Technology has outpaced the budgeting process for IT in most districts. Mandates such as No Child Left Behind have put enormous strain on technology budgets and the resources to comply. The human resources budget for technology has also grown, especially for those qualified to support the technology. This has affected the budgeting process for technology in the classroom.

Auburn features a centralized server-based computing solution.

Client server technology in this current age of computing is an expensive proposition, especially with the advent of newer technology that can address the cost issues. Auburn's visionary leaders were determined to find a better solution to the rising costs in technology budgets and looked into different methodologies and areas where these costs could be reduced.

Realigning Technology in the Classroom

Replacing existing computers in the classroom with brand new desktops is an expensive proposition. In addition, all the components in a fully loaded PC are not necessary for teaching computer fundamentals and software applications. Auburn wanted to ensure that all staff, administrators, teachers and students had access to the latest information and applications at all times—from classrooms, offices, homes and libraries.

In 1999, Schultz and Newpher knew that managing technology improves teaching, learning and performance, both in and out of the classroom. In order to realign the information technology and application services districtwide, a new information technology infrastructure would be a key component in building a solid foundation and reducing costs.

To ensure the success of the Building Linkages in Information Technologies Initiative project, Auburn needed a robust infrastructure that would support the delivery of applications to its users with minimal bandwidth and excellent response times. Auburn decided to implement an "on-demand" solution to address information access and reduce the costs of delivering applications and critical information to all stakeholders. To address these issues Auburn first developed an access strategy.

Access Strategy

An access strategy is a plan to integrate information technology into an educational facility or district, allowing students, teachers, staff, administrators and parents the ability to access the school's information and applications securely from anyplace, at anytime, using any computer platform. IT is a significant tool to deliver software applications, curriculum, student/financial information, district-wide activities and announcements. Although some of this information was available via the district Web site, a majority of the information was inaccessible from outside the district facility. Access strategy addresses these issues and provides the means to effectively consolidate district information and present it in a means that would be accessible to all stakeholders.

The access strategy solution designed by Newpher has enabled Auburn to create a new window for learning, where users can centrally access applications software, daily announcements and shared resources, such as Web content, calendars, schedules, task lists and management projects.

The new access infrastructure now provides more than 2,000 users 24-hour, Web-based access to the most current educational software applications such as Microsoft Office XP, Microsoft Exchange Collaborative Services and Pearson Technologies SASI, which provides teachers and staff with application tool sets to effectively communicate and meet the No Child Left Behind mandates. The access strategy solution provides students with access to the applications required in the classroom, their course curriculum, assignments, and tools to communicate with their peers. Auburn's access strategy was developed on a new and exciting system infrastructure designed around use of a centralized computer platform known as a server-based computing solution.

Server-Based Computing Solutions

A server-based computing solution moves the technology away from the traditional client server model. In a server-based computing environment, the emphasis of processing applications

Teachers utilize Auburn's IT infrastructure for professional development.

on the PC is moved to the server. A PC or a small device known as a thin device can be used to communicate with a Windows session running on a server. The PC or thin device passes keyboard and screen information over the wire leaving most of the information on the servers to be processed. The traditional PC can be replaced with a thin device when necessary or used as a thin device to extend the life cycle of the PC.

Using thin client technology significantly reduces the overhead on a network infrastructure by eliminating most of the data passing over the wire. This makes the thin technology ideal for Auburn's access strategy, since the technology provides for secure communications over the Internet. Thin technology also provides for immediate deployment of application software for all users, since it only needs to be loaded once and published across multiple servers.

The server-based computing solution has enabled Auburn to significantly reduce the management costs of delivering application services as well as lowering the costs in the classroom. The use of thin client technology has resulted in a higher computer-to-student ratio and a lower cost of ownership. Now Auburn can centrally access applications within seconds using any standard Web browser, from anyplace at anytime.

Technology of the Future—Today

Auburn has now created a more efficient and flexible classroom environment with the use of technology. Using the new access infrastructure, Auburn can now focus on technology initiatives that are geared to enhance the teaching and learning experience in and out of the classroom.

Enhanced technology projects now under way using Auburn's access infrastructure include:

- Associate School Integration—providing application services to our associate schools;
- Technology/Curriculum Integration—a blackboard networked learning environment for online content delivery;
- Online Streaming Video—content for blended learning and business applications; and
- Podcasting—delivering mobile content to students.

The future is now at Auburn. Technology has impacted every aspect of the classroom. Schultz and Newpher are looking forward to addressing issues related to managing technology that improves culture, teaching, learning and performance in and out of the classroom.

J. Cameron Newpher, president of iTe Consultants, is Auburn Career Center's information technology consultant. He can be contacted at cnewpher@iteconsultants.com.

For more information, about Auburn Career Center, please contact Thomas Schultz at 800-544-9750, ext. 8010, or by e-mail tschultz@auburncc.org. You can also visit Auburn's Web site at www.auburncc.org.

Speaking of IT at Auburn

Here are some of the things teachers, staff and administrators are saying about using IT at Auburn.

"Our staff has embraced technology. We provide our students and the community with an exceptional quality of the training, dedication and professionalism combined with state-of-the-art technology that makes the learning experience effective and enjoyable. Auburn gives the possibility to learn, understand and develop skills crucial in today's globally accessible economy."
—G. Thomas Schultz, superintendent

"Utilizing technology in the classroom helps me to teach our students what the future looks like, because technology is going to be in their future. Technology also permits me to use the classroom more efficiently."
—Dave Richards, horticulture instructor

"A popular and newer form of learning is online learning. The advantages are many fold, including accelerating the pace, challenging the student, and allowing a convenient educational atmosphere for the student to learn. The limits and barriers are boundless with technology."
—Margaret Lynch, director of curriculum

"At Auburn, we are continuously looking at the newest innovations in technology. A dramatic shift is occurring in learning through the use of Podcasts, especially in education. We are rapidly incorporating such advancements to benefit our students' learning time. Where we once only learned in a classroom, we are now able to listen to that same lecture while on the move and are effectively expanding the instruction time without being in the classroom. Students can now learn as they drive a car, at breaks, at work or in between classes—wherever and whenever they choose."
—Jeff Butler, business development

"As technology continues to advance at an ever more rapid pace, we have been challenged to continuously evolve our training materials, topics, method of delivery and client support structure. Our success in these areas provides the community with multiple training and support platforms to suit their specific needs."
—Debbie Urankar, information technology coordinator