The State of Technology in NC Public Schools:
A Brief on AMTR 2003

The Annual Media and Technology Report (AMTR) is issued to each school in the state every year. Schools report on their physical infrastructure (computers, networks, peripherals), software titles, personnel, and library holdings. Where applicable, I will reference changes between 2003 and last year's report. An important caveat is that the AMTR is based on *self-reported* data collected from the school personnel. To my knowledge, there is no audit or verification of results (someone correct me if I'm wrong). Therefore, we can only say that the AMTR at best reflects the *perceived* state of technology in NC schools, not necessarily what is actually going on.

Personnel

As always, the personnel section is the most interesting, so I'll begin here. The Department of Public Instruction (DPI) has defined a district-by-district recommended level of technology support according to technology and media positions. These positions are split into two categories: *instructional support* and *technical support*. For the most part, *instructional support* refers to those who work with teachers and students to facilitate integration and learning. *Technical support* refers to the various network and media technicians necessary to maintain the physical infrastructure. Taken together, they represent the *total needed technology support* level. So, how close are we? The average number of support personnel by position recommended by the state is as follows:

Position	Recommended #:	LEA avg.
Chief Technology Officer	1	0.18
Technology Coordinators	2	1
Technology Facilitators	18	3
Technology Assistants	18	3
Technicians	9	4.5

First, 18% of LEAs report a full-time Chief Technology officer – that's down from 20% last year. This year also shows a 2% drop in full-time technology directors (60% of LEAs report having them). On average, each district employs half as many technology coordinators and technicians as necessary and less than 20% of the requisite support personnel for teachers and students in schools. Whereas these averages reflect no change since 2002, the percentage districts reporting "none" for each position has been reduced significantly (see Figure 1, below). Still, approximately 83% of schools lack a full-time certified (077 or 079) technology facilitator on staff. This represents no change since 2002.

LEAs report an average of 1 Level I, Level II, and Level III technician each per district. Again, half of NC school districts report having zero Level Is or IIs – and nearly 2/3 report having no Level IIIs available.

Position	Percentage of LEAs reporting "none" on staff		
	2002	2003	% change
Technology Facilitator	70%	50%	-20%
Technician I	55%	49%	-6%
Technician II	63%	48%	-15%
Technician III	83%	63%	-20%

Figure 1: Percentage of LEAs without key technology support personnel

On average, approximately one-quarter of the total needed technology support for the operation of public schools is in place. Viewed separately, only 20% of the necessary *instructional* technology support is in place – compared to 46% of the needed *technical* support in place. There is wide variance among the LEAs here, as well, ranging from 0% of total support in place (Stoke County) to 77% (Greene County). Nearly three-quarters of LEAs are further behind in instructional support than technical support.

Watauga Co. ranks #2 in the state in total support in place as well as instructional support in place (behind Greene County on both). Watauga is one of only a handful of districts that have invested more in instructional technology support (80%) than technical support (40% - ranked 70th) in technology support in place. Still, success is relative, with a total percentage of needed technology support in the county topping off at 72%.

LEA (rank)	Total %		Instructional		Technical	
	2002	2003	2002	2003	2002	2003
Watauga (2)	59	72 (+13)	64	80	40	40
McDowell (13)	52	53 (+1)	53	56	51	43
Caldwell (15)	30	51 (+21)	32	52	21	45
Allegheny (36)	16	33 (+17)	10	43	45	0
Forsyth (44)	4	29 (+25)	1	29	18	28
Ashe (54)	19	26 (+7)	11	13	49	70
Burke (73)	38	19 (+19)	34	11	62	55*
Wilkes (74)	14	18 (+4)	14	14	12	33
Avery (107)	20	9 (+11)	14	5	64	33

Figure 2: Percentage of needed support personnel in place 2002 vs. 2003

***** within the last month, Burke Co. has hired two of our grads into Instructional positions so they should move up next year.

***Half* of all schools in North Carolina do not have a technology facilitator of any kind on staff.** In addition, *half* of all schools in North Carolina do not have a technology coordinator on staff. That's over 1,100 schools operating either without assistance or without guidance for teachers attempting to integrate technology for instructional uses into their daily teaching routines.

Clearly, in the world of technology support personnel, the districts across this state are either haves or have-nots. And those who have, are likely to have twice as much technical support as instructional support. Mostly, however, they are have-nots.

Education that 'counts'

In comparison, LEAs report an average of 14.25 data managers per district: 8 elementary, 3.25 middle school, and 3 high school. **Less than 10% reported "zero" data managers.** Indeed, 94% of schools have a SIMS/NCWISE coordinator in their district – a four percent *increase* since 2002.

The gap between data and student is widening, as LEAs add SIMS/NCWISE personnel while trimming or stagnating full-time technology personnel. In 2003 – as in 2002 – there are twice as many data managers as technology facilitators in NC school districts.

About 10% of full-time tech/media personnel in LEAs actually work with kids and teachers in schools. Data managers comprise nearly one-quarter (23.5%), while the rest – about two-thirds – work to maintain the physical infrastructure of the system.

Policy & Planning

Nearly half (48%) of LEAs are without a board-approved network security policy in place, and 20% lack board-approved policies for protecting the privacy of students' data. This is an improvement from last year, when 1 in 4 districts left student data privacy rights unprotected.

In 2003, 70% of schools have a school-level technology plan, an increase of 4%. Of those who do not have one, 80% have no intention of creating one. In the only drastic improvement so far, the percentage of those schools with technology plans that are *not* aligned with their district's dropped from 1 in 3 to less than 1 in 10.

Environment

Nearly 2/3 (62%) of LEAs have a wireless LAN in operation within their system. Still, only 20% of schools have mobile wireless labs. One-third of schools with labs have set scheduling. Another one-third have partially-flexible scheduling. About half of schools make their media center accessible to students after school hours.

The average title in most school media centers is older than the majority of students in school.

The mean age of media collection titles is 17. Nearly every school (95%) purchased books this year, purchasing an average of nearly 720 titles per school. Yet, only 5% of schools have electronic books available, with an average collection size of less than 30. This, despite the emerging base of cheap or freely-available titles available today. For example, the electronic text center at the University of Virginia has 1,800 titles – including Shakespeare, Crane, Alcott, and many other classics our students read each year – publicly available for download in their entirety to PalmPilots or other PDAs. For nearly 2 years, the ETC has averaged a download rate of 7 books per minute from their website. (http://etext.lib.virginia.edu/ebooks/ebooklist.html)

Nearly all classrooms (95%) have Internet access. Almost all LEAs (98%) use an Internet filtering system Most LEAs control digital content at the district level -- only 13% of schools have a firewall in place at the school level. Unfortunately, district-level control threatens teacher autonomy, student inquiry, and the 'teachable moment' because modifications or exceptions to content filtering rules must be made at the central office and not at the school. These data challenge the "well, teachers who know can simply disable it" rationale for technology-based content filtering, IMHO.

In 2002, still, 25% of classrooms are without phones. Comparatively, only 5% of classrooms are without a TV.

Hardware / Software

There are over 350,000 "modern" instructional computers in NC public schools. There are an additional 49,000 modern administrative computers. Most of the instructional computers are PCs (82%). "Modern" is defined by DPI as any computer above a 486 (PC) or G3 (Mac). There are also more than 15,000 "legacy" (euphemism for "old and unusable") instructional computers and 1,200 legacy administrative computers. Legacy computers are defined as 486 or lower for PCs and less than a PowerPC for Macs.

Legacy computers comprise nearly 5% of all instructional computers in schools – compared to just 2% of administrative computers.

Nearly 80% of desktops in NC schools are running Windows 95 or Windows 98. Since then, Microsoft has release two major revisions (2000 and XP). The most current, Windows XP, requires at least 300 MHz processing speed and 128 Mb of RAM to run – in essence, at least a Pentium III. Likewise, the latest Macintosh operating system (OS X) requires at least a G3 processor with no less than 128 Mb of RAM. So, if we define a "modern" computer as one that actually is capable of running modern operating systems and modern software, then the numbers look like this:

Type	#	% of category	% of total non-legacy computers in schools
Desktop PCs (76%)	153,500	60	45
Laptop PCs (6%)	12,300	59	4
Total PCs (82%)	*165,800*	*60*	*49*
Desktop Macs (16%)	35,000	63	10
Laptop Macs (1%)	4,230	83	1
Total Macs (17%)	*39,230*	*65*	*11*
Total:	**204,000**	**60**	**60**

Figure 3: Number and percentage (of actually modern, in category, and of total) of actually modern instructional computers

Approximately 4 of every 10 computers used for instructional purposes in schools is too antiquated to be useful. They may 'count,' but they do not contribute. Windows-based PCs account for 82% of all instructional computers in schools. Actually modern PCs, however, comprise less than half of all instructional computers in North Carolina schools. About 1 in 10 actually modern instructional computers in schools is a Macintosh. Macintosh laptops are far more likely to be modern (83%) than any other category of instructional computer (the others ranging from 59% - 63%); however, they account for only 1% of all non-legacy instructional computers in schools. Now, let's look at administrative computers:

Type	#	% of category	% of total non-legacy computers in schools
Desktop PCs (77%)	32,300	74	56
Laptop PCs (17%)	6,350	63	11
Total PCs (94%)	*38,650*	*72*	*67*
Desktop Macs (4%)	1,325	56	2
Laptop Macs (2%)	585	54	1
Total Macs (6%)	*1,910*	*56*	*3*
Total:	**40,560**	**71**	**60**

Figure 4: Number and percentage (of actually modern, in category, and of total) of actually modern administrative computers

Interestingly, we see a different picture. Less than 3 in 10 computers are antiquated. Nearly all administrative computers are Windows-based PCs (94%), two-thirds of which are actually modern. Administrative PCs are far more likely to be actually modern compared to instructional PCs. However, the opposite is true with Macintoshes.

Administrators are far more likely to be using actually modern computers when compared to students and teachers in NC public schools. Two-thirds of all administrative PCs are actually modern, compared to just half of all instructional PCs. Students and teachers are nearly 4 times more likely to be using a Mac than administrators.

Around 42% of schools have computer laptops available for check out. Averaged across the 2,500 schools in NC, that about 5.5 actually modern laptops per school .

Two-thirds of LEAs make personal digital assistants (PDA) available to their administrators. I found no correlate question for teachers or students in the report.

The most common instructional software in place in schools? No contest. More than three-quarters (78%) of schools are using Accelerated Reader.

Online learning

Online learning must now become a critical component of schooling, and the AMTR provides an important glimpse into LEA's readiness to address a need that is ubiquitous – and imminent. Consider this: a recent survey of district leaders administered by the National School Board Foundation suggests that, within the next three years, as many as 1 in 5 students in U.S. public schools will experience a significant portion of their schooling online (NSBF, 2002). Imagine all of the students in Wake County and Charlotte-Mecklenburg combined, learning online in 2005. Even a more conservative estimate of only 5% of students in NC following such a trend places more than 65,000 students in this category – more students than served by the third-largest LEA in NC (Guilford County).

About 1 in 5 teachers (22%) in NC public schools have a class website. This is a 6% increase from last year. Only 13% of schools provide email accounts for their students – a 5% increase from 2002. Approximately half of LEAs offer online professional development (only 21% offer locally-created online PD). Only 30% have an LEA-level help desk.

The majority of LEAs estimate that less than half of their students have Internet access at home. Only 10% of LEAs believe the majority of their students (76% or more) have Internet access at home.

*** Note:** It is important to note that these are estimates. To my knowledge, there have been no systematic studies of levels of Internet access in North Carolina school-aged children's homes. This, IMHO, represents a dire need for policy, planning, and ultimately the equitable allocation of funds in the near future.

-- *SCB* 10/15/2003

References:

National School Boards Foundation. (2002). Are we there yet? http://www.nsbf.org/thereyet/index.htm

Annual Media and Technology Report (2003). http://tps.dpi.state.nc.us/amtr2003data/