

**Joint Legislative Audit and Review Commission
of the Virginia General Assembly**



**State Funding Formula for
Educational Technology**

**Staff Briefing
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September 8, 2003**

Introduction

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Presentation Outline

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- Introduction and Summary of Findings**
- Background**
- Funding Formula Options for Various Educational Technology Cost Components**
- Illustrative Funding Formula Combinations and Related Issues**

Virginia Has Shown a Commitment to Educational Technology

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- **State goals and requirements pertaining to educational technology have been adopted both legislatively and administratively. For example:**
 - **The Standards of Quality (SOQ) require local school boards to implement a program of instruction “which emphasizes ... proficiency in the use of computers and related technology.**
 - **Section 22.1-199.1 of the Code of Virginia states that “the General Assembly finds that educational technology is one of the most important components... in ensuring the delivery of quality public school education throughout the Commonwealth.”**
 - **The Standards of Learning (SOL) contain specific computer/technology standards for grades five, eight, and 12.**

Educational Technology Has Been an Increasing Priority

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- **Divisions have increased the use of technology in their schools in response to State and federal policies, and to better prepare students for college and the work environment.**

- **Two of the most challenging funding issues faced by divisions in improving their educational technology programs are:**
 - **Technology staff**
 - **Replacement of technology equipment**

Study Mandate

- **Senate Joint Resolution 87 (2002) directs JLARC to:**
 - **recommend a state funding formula for educational technology and technology support personnel, and**
 - **assess ways to enhance the use of federal and private sector assistance for educational technology.**

- **Purpose of report is to explore how different aspects of educational technology can be addressed through a funding formula.**

- **Amount of funding the State should contribute to go above and beyond the existing State standards and the SOQ framework is a policy question for the General Assembly.**

Research Activities

- **Analysis of data collected by the Virginia Department of Education (DOE)**
 - 2000-2001 and 2001-2002 Annual School Report
 - DOE's 2001 and 2002 Capacity-Connectivity Survey of school divisions
- **JLARC survey of Virginia's school divisions to supplement technology data collected by DOE**
- **Site visits with a subset of school divisions**
- **Session at the 2002 Virginia Society for Technology in Education (VSTE) Annual Conference**
- **Research and interviews with educational technology experts within Virginia, in other states, and at national organizations and consortiums.**

Summary of Findings

- **Significant progress has been made in the Commonwealth in funding technology personnel, in funding non-personnel items such as computers, and in funding other aspects of educational technology such as teacher training.**
- **Nearly all divisions have given substantial access to students to use computers in the school environment.**
- **The Board of Education has recognized the need to institutionalize technology funding by adopting specific minimum technology personnel requirements for inclusion in the proposed SOQ for the upcoming biennium, which could impact SOQ costs.**

Summary of Findings

(continued)

- **Technology funding will be an ongoing need at the State and local level, particularly the replacement of hardware and personnel costs.**
- **State involvement in the ongoing support of technology funding could allow more local divisions to replace computers on a timely basis and provide the personnel needed for the effective use and maintenance of the technology.**

Summary of Findings

(continued)

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- **Report presents funding formula options for the following areas:**
 - **Technology personnel**
 - **Integration specialists**
 - **Technical support staff**
 - **Hardware replacement**
 - **Other non-personnel costs and training**

- **Most viable and promising funding formula options are presented in five illustrative funding combinations**

Summary of Findings

(continued)

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- **The State is already maximizing support from major federal educational technology programs.**
 - **New federal Education Technology Grants are provided on a formula basis.**
 - **According to Department of Education (DOE) officials, several factors prevent Virginia's school divisions from obtaining more E-Rate funds.**

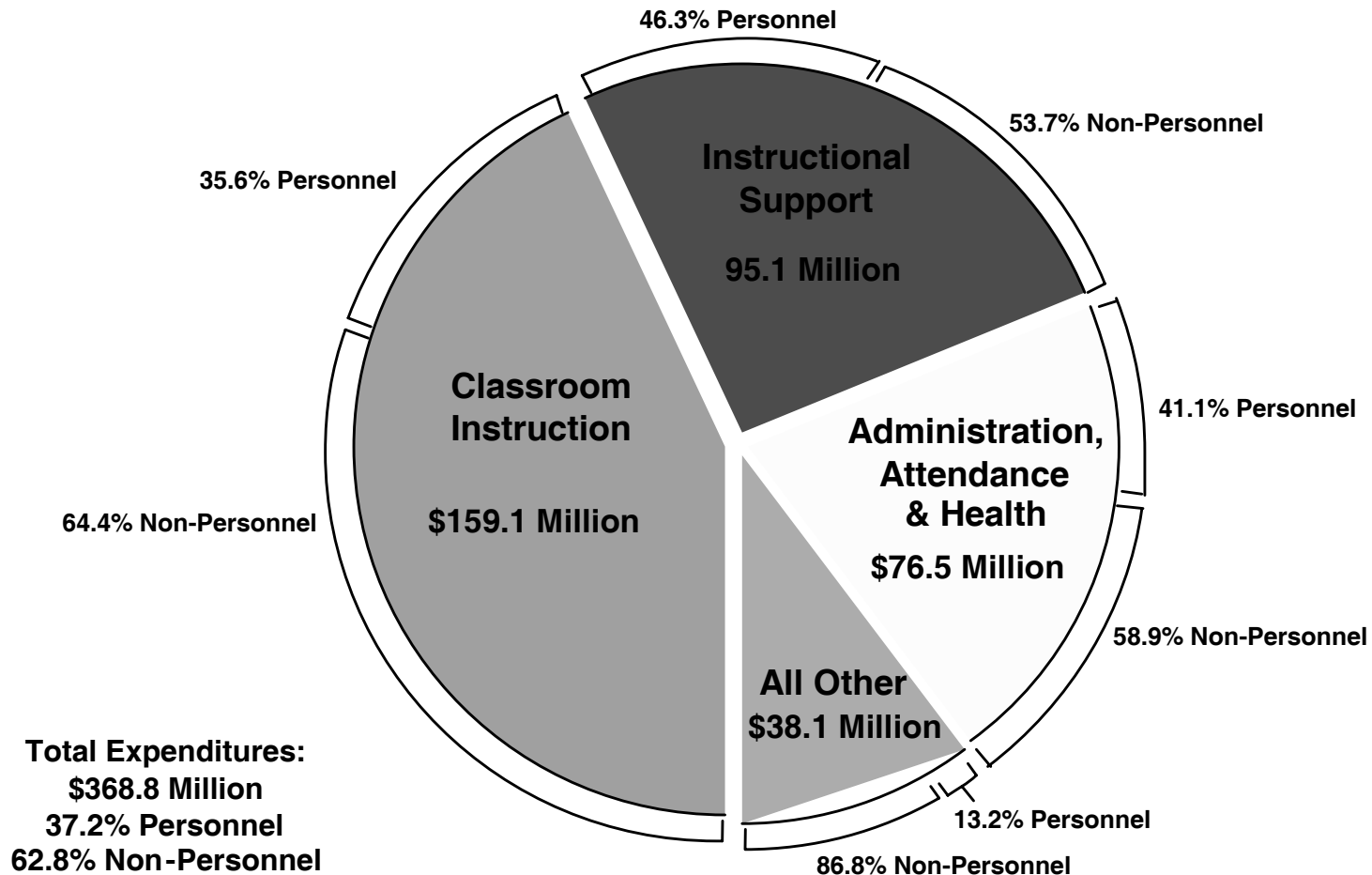
- **New State tax credits for businesses that contribute technology resources to schools do not appear necessary.**
 - **Donated resources are often too old, are costly for divisions to maintain, or are unreliable**
 - **Education foundations (established in the *Code of Virginia*) already exist through which divisions can channel tax deductible technology donations.**

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Total School Division Expenditures for Technology by Function, FY 2002



State and Federal Funding for Technology

■ State funding for educational technology:

- The largest source of State funding is the Standards of Quality (about \$100 million annually), although this funding has not been separately identified or earmarked for technology purposes.
- The State also provides funding through technology initiatives, the largest of which is the Virginia Public School Authority Initiative (\$58 million authorized annually).

■ Federal funding for educational technology:

- Virginia receives around \$25 million annually in discounts and payments through the E-Rate program and the Educational Technology Grant program.

Presentation Outline

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 - Technology Integration Specialists
 - Technical Support Staff
 - Hardware Replacement
 - Other Non-personnel and Training
- Illustrative Funding Formula Combinations and Related Issues

Adequate Levels of Technology Support Staff Require Ongoing Funding

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- **Site visits to school divisions and a survey of divisions indicated that technology staffing is one of the top areas where divisions feel increased State support is needed.**

- **Two types of technology staffing could be recognized through a State funding formula:**
 - **Technology integration specialists**
 - **Technical support staff**

Technology Integration Specialists

- **Technology integration staff help teachers integrate the use of technology into their regular classroom curricula.**
- **Although educational technology experts and school division staff indicate the importance of this position for utilizing technology, nearly half of Virginia's school divisions did not report employing technology integration specialists.**
- **Where integration specialists were not employed, the primary reason given was a lack of funds.**
- **Providing ongoing funds for integration specialists is an area in which the State could make a meaningful contribution to educational technology, and in fact, the Board of Education has included such specialists in its proposed revisions to the SOQ for the upcoming biennium.**

Summary of Funding Formula Options for Technology Integration Specialists

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- **Prevailing Cost Option – Based on the typical (linear weighted average) number of integration specialists provided by school divisions.**
- **DOE Advanced Level Staffing Ratios – Based on staffing ratios recommended by DOE at the advanced level of technology in schools in guidelines recently provided to the Board of Education.**
- **Board of Education-based Option – Based on the Board’s recent proposed revision to the SOQ of adding 1 instructional technology position per 1,000 students.**
- **Site-based Model – Based on providing 1 integration specialist for every school with adjustments for very large or very small schools.**

Summary of Funding Formula Options for Technology Integration Specialists (Continued)

Estimated FY 2002 Base Salary and Benefit Costs

- **Prevailing Cost Option (316 FTEs)** \$15.2 million
- **DOE Advanced Level Staffing Ratios (564 FTEs)** \$27.2 million
- **Board of Education-based Option (1,144 FTEs)** \$55.2 million
- **Site-based Model (1,934 FTEs)** \$93.1 million

Note: Cost estimates shown are both State and local costs.

Summary of Funding Formula Options for Technology Integration Specialists (Continued)

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- Since a number of divisions indicated that they are currently unable to hire an adequate number of integration specialists, it does not appear that the prevailing cost option would meet divisions' needs.
- Providing integration specialists using the site-based model would yield the level of integration staffing most desired by school divisions, but it is also the most expensive option.
- The DOE advanced level staffing ratios and the Board of Education-based option would not provide the level of support desired by some divisions, but would be a large improvement over the level of funding currently provided by the State.

Technical Support Staff

- **Many divisions indicated that technical support staffing was another priority area where ongoing State support is needed.**
- **Increased State funding may help divisions raise their level of technical support.**
- **Some divisions further indicated that increased State support would allow them to free up funds for other technology purposes, such as hardware or infrastructure.**

Summary of Funding Formula Options for Technical Support Staff

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- **Prevailing Cost Option – Based on the typical (linear weighted average) number of technology support staff positions provided by school divisions.**
- **DOE Advanced Level Staffing Ratios – Based on staffing ratios DOE recommended by DOE at the advanced level of technology in schools in guidelines recently provided to the Board of Education.**
- **Board of Education-based Option – Based on the Board’s recent proposed revision to the SOQ of adding 1 technical support position per 1,000 students.**

Summary of Funding Formula Options for Technical Support Staff (Continued)

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- **Site-based Model – Based on providing 1 technical support position for every school with adjustments for very large or very small schools.**
- **High School Technology Resource Initiative – Based on expanding the High School Technology Resource Initiative to elementary, middle, and adult education schools.**
- **Industry Standards Option – Based on providing 1 support person for every 50 computers.**

Summary of Funding Formula Options for Technical Support Staff

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Estimated FY 2002 Base Salary and Benefit Costs

- **Prevailing Cost Option (1,664 FTEs)** **\$73.2 million**
- **DOE Advanced Level Staffing Ratios (1,866 FTEs)** **\$83.0 million**
- **Board of Education-based Option (1,619 FTEs)** **\$71.3 million**
- **Site-Based Model (2,378 FTEs)** **\$100.8 million**
- **High School Technology Resource Initiative** **\$49.6 million**
- **Industry Standards Option (4,575 FTEs)** **\$196.4 million**

Summary of Funding Formula Options for Technical Support Staff (Continued)

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- **The least costly option is to reinstate and expand the High School Technology Resource Initiative, but it is a relatively arbitrary way to fund technology support.**
- **The prevailing cost option reflects actual division expenditures, but does not make a judgment about whether the levels of support provided by divisions is adequate or appropriate.**
- **In contrast, the Board of Education-based option, the DOE advanced level staffing ratios, and the site-based model provide some guidance as to the level of technology support that should be provided in schools.**

Hardware Replacement

- Educational technology experts recommend replacing technology hardware every three to five years.
- Over 75 percent of Virginia's school divisions reported being unable to fully fund a regular replacement cycle for their computers.
- As school divisions continue to add computers to meet the State's goal of a five-to-one student-to-computer ratio, additional funding is needed to replace the growing number of computers as they age.
- Funding formulas included in this report are designed to cover hardware replacement. They do not cover the funding needs for additional hardware, which is currently funded through the State's VPSA Technology Initiative.

Summary of Funding Formula Options for Hardware Replacement

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- **Prevailing Cost Option – Based on the typical (linear weighted average) hardware replacement expenditures made by school divisions.**
- **5 to 1 Student-to-computer Ratio/5-Year Replacement Cycle**
- **5 to 1 Student-to-computer Ratio plus Administrative Computers/5-Year Replacement Cycle**
- **3 to 1 Student-to-computer Ratio/5-Year Replacement Cycle**
- **1 to 1 Student-to-computer Ratio/5-Year Replacement Cycle**

Summary of Funding Formula Options for Hardware Replacement (Continued)

	Estimated FY 2002 Base Year Cost
● Prevailing Cost Option	\$48.61 million
● 5 to 1 Student-to-computer Ratio/5Year Replacement Cycle	\$63.75 million
● 5 to 1 Student-to-computer Ratio plus Administrative Computers/5 Year Replacement Cycle	\$64.1 million
● 3 to 1 Student-to-computer Ratio/5Year Replacement Cycle	\$103.02 million
● 1 to 1 Student-to-computer Ratio/5Year Replacement Cycle	\$299.33 million

Note: (1) All options, with the exception of the prevailing option, include an add-on cost of peripherals. This amount is based on the assumption that peripherals account for approximately 10 percent of hardware costs. (2) Cost estimates shown are both State and local costs.

Summary of Funding Formula Options for Hardware Replacement (Continued)

- The lowest cost option bases funding on prevailing expenditures for hardware replacement.
- The second least expensive option is based on a 5-to-1 student-to-computer ratio with a five-year replacement cycle.
 - Reflects the State's current goals for student access to computers and a replacement cycle in the range recommended by technology experts and school division staff.
- Assuming a 1-to-1 student-to-computer ratio is the highest cost option. However, most divisions do not currently provide this level of access. A 3-to-1 ratio reflects an intermediate step before moving to a 1-to-1 ratio.

Funding Formula Options for Other Non-Personnel Costs

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- Beyond technology hardware, there are other non-personnel technology costs that school divisions must incur.
- Divisions indicated that technology infrastructure can be a high area of need for funding. However, infrastructure costs tend to vary and are difficult to model.
- School divisions recognized that other non-personnel items -- such as software and supplies, connectivity costs, and other items -- present real costs, but did not place them as a high priority for increased State support at this time.

Summary of Funding Formula Options for Other Non-Personnel Costs

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- **Funding formula options for other non-personnel costs are based on the typical (linear weighted average) expenditures made by school divisions in these areas.**
 - **Infrastructure Replacement Option**
 - **Software and Supplies Options**
 - **Connectivity Option**
 - **Other Non-personnel Option**

Summary of Funding Formula Options for Other Non-Personnel Costs (Continued)

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Estimated FY 2002 Base Year Costs

• Infrastructure Option	\$3.86 million
• Software and Supplies Option	\$24.59 million
• Connectivity Option	\$8.95 million
• Other Non-Personnel Option	\$29.20 million
Total State and Local Costs for All Non-Personnel Options	\$66.60 million

Note: Includes State and local costs.

Technology Training for Teachers

- Educational technology experts and school division staff indicate that teacher training is critical to ensuring a successful technology program.
- In site visits, school divisions also indicated that existing State and federal funds available for technology training are sufficient to cover current needs, at least for traditional forms of technology training.
- Further, division staff said that the most effective technology training occurs when technology staff are available to assist teachers with their immediate needs on a one-on-one basis.
- Additional State funding to help divisions hire technology integration specialists may be the most effective way to help divisions better train their teachers in the use of technology.

Presentation Outline

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Illustrative Funding Combinations

- **The five illustrative funding combinations in the report include only those funding formula options that appear to be the most viable and best address the concerns of school divisions.**
- **The funding combinations largely have the effect of redistributing technology costs currently paid by localities alone into a funding formula where a greater portion of the costs are shared with the State.**

Summary of Illustrative Funding Combinations

(Estimated Total State and Local Costs)

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	FY 2002
Combination 1: Prevailing Costs	\$203,628,435
Combination 2: DOE Advanced Level Staffing Guidelines; 5:1 Ratio, 5-Year Hardware Replacement Model	\$240,588,274
Combination 3: Board of Education-based Recommendation; 5:1 Ratio, 5-Year Hardware Replacement Model*	\$256,858,949
Combination 4: Site-based Model; 5:1 Ratio, 5-Year Hardware Replacement Model	\$324,214,847
Combination 5: Higher Aspiration Option; 1:1 Ratio, 5-Year Hardware Replacement Model	\$559,786,490
Total Estimated <u>State and Local</u> Dollars Spent in FY 2002	\$368,784,677

*The Board of Education is recommending a 4-year phase-in of the revisions that it is proposing to the SOQ. FY 2005 and FY 2006 costs shown here are the costs for the full implementation of the recommendation.

Summary of Illustrative Funding Combinations

- **Combination One is the least expensive combination and bases funding on a linear weighted average of what divisions are currently spending on technology.**
- **Combinations Two and Three represent recent State policies and recommendations in educational technology.**
- **Combination Four best represents what several visited school divisions stated would be most appropriate in terms of meeting technology support personnel and hardware replacement needs.**
- **Combination Five is the most expensive combination and would provide a very high level of technology support and student access to computers.**

Estimated Net Increase in State Costs of Illustrative Funding Combinations*

(in Millions)

	FY 2005 (State Cost)	<i>Estimated Increase Over FY 2002</i>	FY 2006 (State Cost)	<i>Estimated Increase Over FY 2002</i>
Combination 1: Prevailing Costs	\$124.9	\$27.8	129.4	\$32.3
Combination 2: DOE Advanced Level Staffing Guidelines; 5:1 Ratio, 5-Year Hardware Replacement Model	\$148.2	\$51.1	\$153.4	\$56.3
Combination 3: Board of Education-based Recommendation; 5:1 Ratio, 5-Year Hardware Replacement Model**	\$157.8	\$60.7	\$162.9	\$65.8
Combination 4: Site-based Model; 5:1 Ratio, 5-Year Hardware Replacement Model	\$200.5	\$103.4	\$207.7	\$110.6
Combination 5: Higher Aspiration Option; 1:1 Ratio, 5-Year Hardware Replacement Model	\$345.1	\$248.0	\$356.9	\$259.8
Estimated FY 2002 State Share of Standards of Quality Technology Funding \$97.1 million				
<p>*Estimates do not assume any changes in current use of State initiative funding.</p> <p>**The Board of Education is recommending a 4-year phase-in of the revisions that it is proposing to the SOQ. FY 2005 and FY 2006 costs shown here are the costs for the full implementation of the recommendation.</p>				

Summary of Potential Actions Regarding the Annual School Report

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ASR Data Collection:	If the General Assembly decides to adopt a funding formula for educational technology, it may wish to direct DOE to collect more detailed data on certain technology cost components through the Annual School Report (ASR).
Analysis of ASR Data:	If the General Assembly decides to adopt a funding formula for educational technology, it may wish to direct DOE to conduct preliminary analysis, such as outlier analysis, to help identify school divisions that have not reported their technology expenditures in the technology section of the ASR.
Consistency of ASR Data:	If the General Assembly decides to adopt a funding formula for educational technology non-personnel costs, it may wish to Work with DOE, and other State agencies as is necessary, to set a consistent capitalization threshold for localities for data reporting purposes. Alternatively, the General Assembly may wish to direct DOE to modify the ASR to distinguish between Expenditures for new additions and replacements for non-capitalized hardware and infrastructure.

Technology Funding Formulas Need to Be Routinely Updated Over Time

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- Many aspects of a school division's technology program can and will change over time.
- Therefore, funding formulas that may be appropriate now may not be appropriate in a few years.
- If the General Assembly adopts a funding formula approach for educational technology, perhaps a review of this formula could also be incorporated into the Board of Education's biennial schedule for reviewing the Standards of Quality.

Conclusion

- Pursuant to the study mandate SJR 87, the report identifies several potential educational technology funding options.
- The Board of Education has proposed changes to the SOQ that will require the recognition of certain technology positions, and will therefore have SOQ cost implications.
- The Board of Education's proposal is closest to JLARC Combination 3 (the Board of Education-based combination). There are two combination options in the report with a lesser cost than the Board of Education-based combination, and two combinations with a higher cost.

Computers per 100 Students By Division 2002

