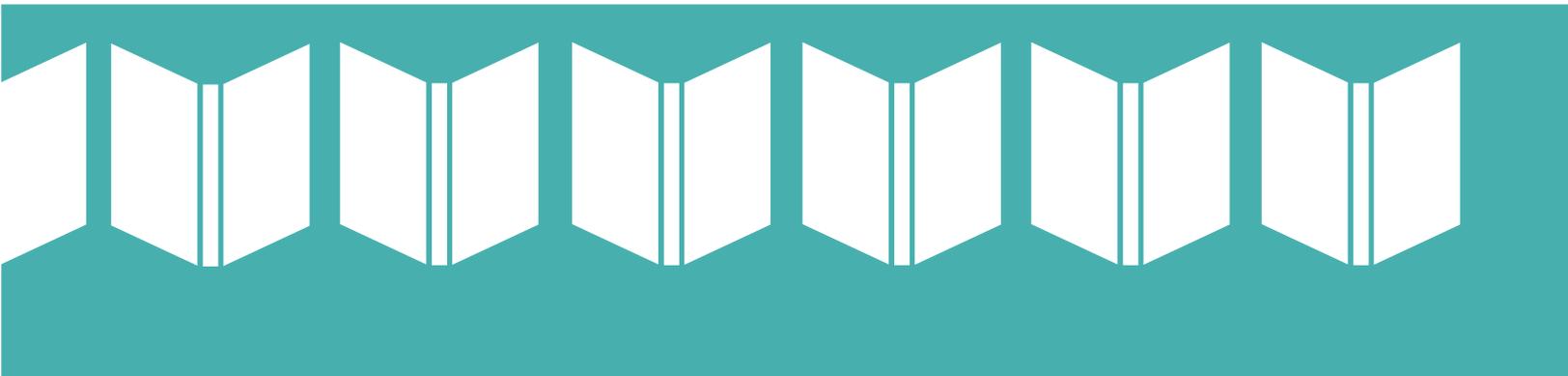Spring
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State Funding for Education Technology and School Infrastructure: Competing Demands and Limited Resources

Faith E. Crampton

Introduction

In spite of signs of an economic recovery at the national level, many states still face formidable fiscal problems.[1] In addition, the national fiscal outlook is compromised by a growing federal deficit, slow growth in job creation, and lingering unemployment in many parts of the country. As such, it is essential to understand the full context for state education funding. In the preK-12 educational domain, personnel costs continue to be the largest single budget item, frequently overshadowing other budgetary demands. Furthermore, in an era of heightened accountability and high stakes testing imposed at the state and national levels, competitive compensation, particularly in shortage areas such as mathematics, science, and special education, and in geographic areas, such as urban and rural school districts, is essential for teacher recruitment and retention. Education reforms, such as class size reduction, aimed at raising academic achievement, require additional staffing–and additional funding. Another costly education reform is education technology, used both to enhance academic achievement and to prepare students for future employment in a global economy. As a fiscal issue, education technology is unique because it spans both operating and capital budgets, making it a potential competitor with school infrastructure needs.

In the best of economic times, state policymakers must carefully weigh funding priorities. However, with deferred maintenance for schools estimated at more than $100 billion dollars,[2] and total unmet funding need for all types of school infrastructure, inclusive of new construction and renovation, estimated at over $260 billion,[3] state policymakers find themselves under tremendous pressure to provide sufficient funding for education and other public services without raising taxes. Setting funding priorities for education technology and school infrastructure may be further complicated by perceptions of their relative worth. For example, the image of engaged students working on state-of-the-art computers may be more compelling to many lawmakers and voters than the replacement of a leaky roof; but both are necessary and costly. The cost of most school infrastructure projects requires multi-year investments by school districts while the costs for education technology are also ongoing, but for different reasons. Because current

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technologies rapidly become obsolete, schools are faced not only with substantial initial investments, but also investments for upgrades and replacements over time.

To that end, this article explores the competition between education technology and school infrastructure for scarce resources in the state educational funding arena. The first section provides a comprehensive definition of education technology to anchor the discussion. Next, data on state funding levels for education technology are presented, followed by a description of the ways states allocate these funds. Here the potential for competition between education technology and school infrastructure emerges. In the third section, state estimates of unmet funding need for education technology are contrasted with those for school infrastructure. The article closes with policy recommendations for the equitable and adequate funding of education technology.

The Scope of Education Technology Needs

It is important to ground the discussion of the potential competition of education technology and school infrastructure for the same pool of funding by defining the scope of education technology needs. As part of a national study of unmet education technology funding needs, researchers at the National Education Association developed a comprehensive definition with the following nine components: (1) Multimedia computers; (2) Peripherals; (3) Operating, applications, and educational software; (4) Connectivity; (5) Networks; (6) Technology infrastructure; (7) Distance education; (8) Maintenance and repair of technology equipment; and (9) Professional development and support. [4]

Multimedia computers are generally newer, faster, and more powerful computers with sound capability and high-resolution graphics. Usually they have an internal CD-ROM and modem, the latter for Internet access. Peripherals represent a category of computer hardware that includes equipment such as printers, assistive/adaptive devices,[5] digital cameras, scanners, and computer projection units. Also included are various pieces of equipment such as CD-ROMS, zip drives, and modems that, although internally installed on many newer computers, are sometimes added externally to older computers. Operating software refers to computer programs, such as DOS and Windows, that provide the foundation for utilizing applications and educational software. Applications software includes computer programs such as word-processing and spreadsheets while educational software represents computer programs that are specifically designed for student learning. Connectivity refers to Internet access, video conferencing, and video phones. Networks found within a school or district include LANs (Local Area Networks) and WANs (Wide Area Networks). Technology infrastructure includes wiring and cables to, within, and between schools. In addition, to accommodate computers and peripherals, electrical upgrades may be needed in order for the school facility to support more electrical outlets; or the school may require more phone lines or fiber optic cables to support connectivity to the Internet. Distance education makes use of a number of components listed above to allow courses to be taught at remote sites. Maintenance and repair of technology equipment includes maintenance contracts and repair costs to keep computers and peripherals functioning properly over the life of the equipment. Professional development and support is necessary so that teachers and other educational professionals make effective use of technology to enhance student learning.

The description above makes evident that education technology needs draw from both the operating and capital budgets of school

districts. With regard to operating budgets, education technology includes personnel costs for professional development and support; maintenance and repair costs for equipment; and the cost of several categories of equipment, which in some cases are categorized as part of the school district's operating budget and, in others, part of the capital budget, depending upon individual state laws around budgeting, bonding, and accounting. Technology infrastructure represents a direct overlap with the broader category of school infrastructure and so is likely to draw upon capital resources within a school district. In the next section, examples of overlap and competition are presented as part of the description of state funding for education technology.

Funding for Education Technology

In 1995-1996, twenty-one states provided $451.6 million for education technology, ranging from $100,000 in Montana to $117 million in Florida.[6] On average, states spent $21.5 million. Three years later, in 1998-1999, the most recent time period for which data are available, 31 states provided $847.8 million to local school districts for education technology funding.[7] (See Appendix.) Funding levels ranged from $600,000 in Delaware to $191.4 million in California, for an average state expenditure of $27.3 million. On a per pupil basis, the average state expenditure for education technology was a mere $27;[8] but these numbers tell only a small part of the funding story. Education technology is funded through a wide range of mechanisms at the state level.

The summary table at the end of the article makes explicit the array of funding mechanisms state use. Some, such as Alabama and Tennessee, fund education technology as part of the state's basic aid formula allocation although the use of funds for education technology by school districts may be restricted to particular expenditure categories. If education technology funding is allocated through state basic aid, there is a reasonable assurance that it is equalized because most basic aid formulas provide greater assistance to property and/or income poor school districts.[9] A number of states use one or more forms of categorical aid. For example, Minnesota funds education technology with seven categorical programs and New York, four. Unlike funding allocated through basic aid, funds distributed through categorical aid programs may or may not be equalized. Pennsylvania and South Carolina provide examples of equalized categorical funding. Other states, like Arkansas and California, may require school districts to submit a grant application to access education technology funds, a potential barrier for some school districts. Four states–Connecticut, Idaho, Illinois, and Washington–distribute a portion of state funding for education technology through a competitive grant process, a process that disadvantages districts lacking grantwriting expertise. At least one state, Kansas, requires the local school district to match state funding for education technology and to have a state-approved education technology plan in order to be eligible for funding. To further complicate the funding picture, some states use a combination of the funding approaches mentioned here.

In nine states, funding programs for education technology compete or overlap with those that have traditionally been considered the province of school infrastructure: Arizona; Connecticut; Minnesota; Missouri; Nebraska; New Jersey; Pennsylvania; Rhode Island; and Texas. In Arizona, the new school capital finance system includes education technology as well as school infrastructure. As such, there is no separate state appropriation for education technology. Like Arizona, Minnesota funds education technology from infrastructure

resources, more specifically, the component of the general education revenue formula which is also used to finance school facilities needs. In Arizona and Minnesota, education technology competes directly with school infrastructure for the same resources. Education technology infrastructure funding in the remaining seven states potentially overlaps with funding for school infrastructure; that is, when education technology infrastructure is funded as a stand alone program, a potential overlap exists as well with school infrastructure funding programs. For example, Missouri's education technology funding program includes the funding of technology infrastructure. In Nebraska, funding for education technology is targeted toward training and technology infrastructure. Connecticut's funding for education technology is limited to the wiring of schools, an infrastructure item, to make them technology-compatible. Texas also limits education technology funding to infrastructure, in particular providing connectivity. However, the Texas funding program is broader than elementary and secondary education in that it includes institutions of higher education, libraries, and hospitals. New Jersey restricts education technology funding to the Distance Learning Network which includes costs associated with professional development, purchase of software, and maintenance, as well as education technology infrastructure. In Pennsylvania, the "Link to Learn" program provides school districts with education technology funding that includes the infrastructure component of cabling for LANs and WANs. Like Pennsylvania, Rhode Island's funding for education technology includes infrastructure.

Since most states allow education technology infrastructure to be funded through broader school infrastructure funding mechanisms that generally permit school districts to incur long-term debt, education technology infrastructure costs may potentially be supported through capital budgets. At the same time, education technology funding programs generally target funds as operating expenditures. Hence in states which fund both school infrastructure and education technology, technology infrastructure funding may be duplicative if it is also eligible for education technology funding. At the state policy level, this configuration raises issues of cost-effectiveness on two fronts. First, it represents duplication of funding effort for education technology infrastructure, and secondly it raises concerns about the appropriate financing of technology infrastructure. Unlike other components of education technology, technology infrastructure represents a long-term investment that may be financed more appropriately in a manner similar to other school infrastructure projects, through long-term debt instruments. Funding education technology infrastructure as a capital investment in turn would free up additional resources for operating expenses associated with education technology, such as professional development and support. In the next section, the extent of unmet funding need for education technology is explored, with special attention to estimates for education technology infrastructure.

Funding Needs for Education Technology

Earlier research has indicated that statewide education technology plans are the best single source for systematic data on education technology funding needs although even these provide only limited data.[10] In 1999, 38 states had statewide education technology plans in place, of which 26 had been developed in the prior five years.[11] Of these, only ten had developed cost estimates. A closer analysis of the cost estimates revealed that only three of the ten states–California,[12] Connecticut,[13] Delaware[14]–had developed cost estimates inclusive of all of the elements of a comprehensive definition of education

technology needs. California's education technology plan was the most costly, calling for an investment of $10.9 billion, or $1,969 per pupil. In contrast, the Connecticut plan estimated unmet funding need at $555.2 million, or $579 per pupil. Delaware's education technology plan called for $120 million in new state dollars, or $1,072 per pupil. For the purposes of estimating total unmet funding need for education technology across states, Delaware was selected as the benchmark, as it represented the median. State estimates ranged from $103.5 million in Wyoming to $10.9 billion in California, for a total of $53.7 billion. (See Table 1.)

The unmet funding need for school infrastructure, estimated at $266.1 billion, is substantial as well. While it was not possible to partition out the portion of education technology plan cost estimates for education technology infrastructure with precision, education technology plans for Illinois[15] and New Mexico[16] may provide some insight as their cost estimates were limited to education technology infrastructure. Illinois projected costs for education technology infrastructure to be $787 million or $399 per pupil, while New Mexico estimated $75.1 million or $237 per pupil. When compared to total estimates for unmet funding need, education technology infrastructure represented 37% and 22% of total unmet funding need for education technology in Illinois and New Mexico, respectively.

Conclusions and Policy Recommendations

This article explored competition between school infrastructure and education technology for limited educational resources. An important first step was to define the scope of education technology funding needs. In doing so, the overlap between education technology infrastructure and the broader category of school infrastructure becomes apparent. An analysis of current state funding revealed a mix of approaches to funding education technology, ranging from basic and categorical aid programs to selective grants. Nine states had some overlap in funding between education technology infrastructure. In some states, education technology is funded through infrastructure programs, even though a number of components of education technology would be considered operating costs. This configuration leads to direct competition between education technology and school infrastructure for education funds. In other states, elements of education technology infrastructure, such as wiring and cabling, appear to be eligible for funding under both education technology and school infrastructure funding provisions. Such overlap creates the potential for duplication and ineffective use of resources.

Because both education technology and school infrastructure suffer from underfunding at the state level, competition and duplication are serious policy issues. To avoid such inefficiencies, policymakers must conceptualize a state education funding system as an integrated whole. Admittedly, because aspects of education technology and school infrastructure can be quite technical, it may be challenging at the policy level to discern the potential for overlap and competition. To enable state policymakers to make informed decisions, appropriate agencies and experts should be deployed to develop comprehensive long-range plans with realistic cost estimates in both education technology and school infrastructure. Yet because unmet funding need for education technology and school infrastructure tops $300 billion, federal involvement may be required. Although states constitutionally are responsible for education funding, the federal government has a long history in intervening in education matters that have become national in scope. However, in order to determine the appropriate federal and state roles,

Table 1

Funding Need for Education Technology

State	Technology
Alabama	$791,643,056
Alaska	141,780,576
Arizona	920,959,488
Arkansas	494,704,416
California	10,901,183,414
Colorado	738,005,536
Connecticut	555,226,320
Delaware	120,021,120
Florida	2,187,697,936
Georgia	1,474,984,096
Hawaii	202,909,232
Idaho	268,321,600
Illinois	2,115,098,880
Indiana	1,059,940,000
Iowa	539,794,880
Kansas	503,561,280
Kentucky	685,628,688
Louisiana	836,972,576
Maine	232,710,832
Maryland	893,500,208
Massachusetts	1,023,047,120
Michigan	1,852,952,000
Minnesota	906,590,400
Mississippi	541,354,640
Missouri	975,861,968
Montana	175,806,928
Nebraska	313,754,032
Nevada	317,977,712
New Hampshire	210,805,584
New Jersey	1,319,695,248
New Mexico	339,560,288
New York	3,035,796,800
North Carolina	1,314,586,096
North Dakota	125,223,536
Ohio	1,977,840,000
Oklahoma	670,011,792
Oregon	579,506,048
Pennsylvania	1,943,407,360
Rhode Island	162,989,024
South Carolina	694,044,960
South Dakota	151,570,080
Tennessee	971,081,920
Texas	4,186,434,432
Utah	513,648,800
Vermont	113,296,464
Virginia	1,190,793,680
Washington	1,062,603,920
West Virginia	322,390,064
Wisconsin	955,782,336
Wyoming	103,532,688
Total	**$53,716,590,054**

better data are needed on the current level of investment in education technology. At that point, a meaningful local/state/federal partnership might be forged to address the pressing need for the funding of education technology and school infrastructure that affects millions of school children in every state of the nation.

Endnotes

[1] According to a publication of the National Conference of State Legislatures, titled *State Budget Update: April 2003*: "State budgets are awash in red ink. For three consecutive years, nearly every state has encountered severe budget shortfalls. These shortages began appearing in FY 2001 and have grown dramatically each year since. Cumulatively, states have had to close gaps approaching $200 billion," http://www.ncsl.org/legis/fiscal/sfo2003.htm#execsum.

[2] U.S. General Accounting Office, *School Facilities: The Condition of America's Schools* (Washington, D.C., February 1995).

[3] "Unmet School Infrastructure Funding Need as a Critical Educational Capacity Issue: Setting The Context," by Faith E. Crampton, in *Saving America's School Infrastructure*, Faith E. Crampton and David C. Thompson, eds. (Greenwich, Connecticut: Information Age Publishers, 2003).

[4] National Education Association, *Modernizing Our Schools: How Much Will It Cost?* (Washington, D.C.: 2000).

[5] Assistive/adaptive devices refer to peripherals that enable individuals with physical disabilities or limitations to utilize technology.

[6] Faith E. Crampton, "The Coming Crisis in Student Access to Education Technology: Revisioning the State and Federal Roles in Funding," in *Technology and the Educational Workplace: Understanding Fiscal Impacts*, Kathleen C. Westbrook, ed., Eighteenth Annual Yearbook of the American Education Finance Association (Thousand Oaks, California: Corwin Press, Inc., 1997), 79-83.

[7] Calculated from data in state chapters, in Catherine C. Sielke, John Dayton, C. Thomas Holmes, and Anne Jefferson, eds., *Public School Finance Programs of the United States and Canada, 1998-1999*, Publication # NCES 2001-309 (Washington, D.C.: U. S. Department of Education, National Center for Education Statistics, 2001), http://www.nces.ed.gov/edfin/state_finance/statefinancing.asp.

[8] Given the nature of the 1995-1996 data, it was not possible to compute a per pupil expenditure figure.

[9] For a description of basic aid formulas, see David C. Thompson and R. Craig Wood, *Money & Schools*, 2d. ed. (Larchmont, New York: Eye on Education, 2001), 73-100.

[10] Crampton, "The Coming Crisis in Student Access to Educational Technology."

[11] National Education Association, 49-53.

[12] "California Department of Education's Education Technology Office Home Page" http://www.cde.ca.gov/edtech/.

[13] Connecticut State Board of Education, *Connecticut Statewide Educational Technology Plan*, Final Report (Marlborough, Massachusetts: Center for Educational Leadership and Technology, December 1995); Connecticut State Department of Education, *Guidelines for Technology Infrastructure in Connecticut Schools*, An Implementation Guide for the *Connecticut Statewide Educational Technology Plan*, In cooperation with the Center for Educational Leadership and Technology (Marlborough, Massachusetts: December 1995).

[14] Delaware Education Network, *Delaware Center for Educational Technology. Strategic Plan FY1999 - FY2001* (Delaware Center for Educational Technology: September 1998); and Delaware Center for Educational Technology, Action Plan FY2000 (April 1999).

[15] Illinois State Board of Education, *K-12 Information Technology Plan* (Springfield, Illinois: State of Illinois, 1996).

[16] New Mexico State Department of Education, *New Mexico's Educational Technology Plan: A Road Map to Student Success* (Santa Fe, New Mexico: January 1999).

State Technology Funding Programs, 1998-1999

State	Funding ($ millions)	Description of State Funding Program
Alabama	3.5	General state aid to local boards of education for technology began with the 1995 Foundation Program. In the calculation of cost factors in the 1995 Foundation Program, one of the components of the Classroom Instruction Support Factor is funding for technology. This shall be a uniform amount for each teacher unit and is recommended annually by the State Board of Education. This amount for Fiscal Year 1998-1999 is $75.00 per teacher unit. This allocation may be expended by school or by the school system as a whole. In addition, allocations from state bond issues are allowed to purchase technology equipment.
Alaska	0	Funding for the state educational technology program was eliminated in 1998.
Arizona	0	Technology is included in the new "Student FIRST" school capital finance system established in Fiscal Year 1998-1999. There is no separate state appropriation for technology, nor is any amount earmarked in the Students FIRST program for technology. The School Facilities Board, which is responsible for implementing the Students FIRST program, has not yet made any decisions related to technology standards, nor has it distributed any money for technology.
Arkansas	2.2	An agency called IMPAC, funded separately from the state school fund, provides computer hardware to school districts. The aid is based upon grant applications and poorer districts are favored.
California	191.4	The Digital High School Program provides grants to high schools to purchase hardware, software and infrastructure, and to train staff in its use. Schools that apply to the program are selected on the basis of a random draw each year. The educational technology program coordinates all of the technology efforts of the California Department of Education: $136.0 million for the Digital High School Program, and $55.4 million for educational technology.
Colorado	0	No state aid provided.
Connecticut	10.0	Now in its fourth year, this program provides funding for the wiring of schools to make them technology compatible. One million dollars is earmarked for the state's largest four urban districts, and the balance is distributed on a competitive basis to other school districts. Local area networks, wide area networks and Internet access have been among the major areas of emphasis for this funding. It should be noted that the school construction grant program also allows wiring to be included in the scope of new construction and building renovations with the state participating in 20% to 80% of eligible costs. Within the limits of the grant awards, the technology grant has provided up to 100% of the cost of wiring a school that has been successful in competing for an award.
Delaware	0.6	The state recently established the Delaware Center for Educational Technology that receives funding from federal, private, as well as state appropriations. For 1998-1999 the state appropriated $614,000 for the center. The center's mission is to assist schools and districts in adopting and adapting to new technologies. Other technology funding falls under Division II (material and supply), while many districts elect to use some of their Division II or III funding towards technology-related purchases.[1]
Florida	80.1	Funds are allocated based on each district's share of the state total unweighted student enrollment. This funding includes $1,000,000 for library automation grants. Public school technology funds may be used to purchase both hardware and software; however, priority is given to students and programs with the highest need and with the oldest equipment.

State	Funding ($ millions)	Description of State Funding Program
Georgia	26.8	Technology funding is supported in Georgia by the lottery. Originally lottery funds could only be used to purchase hardware. A 1996 amendment to the law added training for teachers in the use of technology and repairs and maintenance of technology as additional eligible uses for lottery funds.
Hawaii	0	na[2]
Idaho	10.4	A continuation of funding both on a competitive grant process as well as direct distribution to districts based on a district's percent of the general school income fund.
Illinois	30.8	The State Board of Education awards grants on a competitive basis to school districts for the purpose of implementing the use of computer technology in the classroom. $500,000 has been appropriated from the School Technology Revolving Fund for the purpose of funding the statewide educational network.
Indiana	15.0	The General Assembly provides annual funding to the Indiana Department of Education's Technology Grant Program that is to be distributed to all school corporations [districts] within a six-year cycle. The total grant to a qualifying school corporation is not to exceed $200 per student.
Iowa	30.0	Beginning in 1996-97, the legislature appropriated $30 million for a school improvement technology program. Each district is allocated an equal amount per pupil; however, the minimum amount a district receives is $15,000. The legislation calls for this program to be funded for five years. Funds may be expended for equipment acquisition, installation, maintenance, and software associated with instructional technology. Funds may also be expended for staff development; however, the legislature prohibited the hiring of additional staff with these funds.
Kansas	10.0	There is no provision specifically for technology; however, in 1998-99, the legislature allocated $10 million of windfall tax dollars to K-12 education for technology. The money was used as a matching grant that each school district was eligible for as long as the district had a state-approved technology plan. The money was split between all 304 school districts as a flat $12,500 per district plus $13.70 per student.
Kentucky	15.0	The Master Plan for Education Technology establishes the criteria for funding and access to computer technology. Funds for technology are distributed on a per-pupil basis and, purchases for equipment and software are negotiated for all so that pricing, payment schedules, and all other contracts are the same for each school. All schools have the same access to state-provided support services and networks. Minimum computer-to-student ratios are defined. The state pays 100% of the cost of the district administrative (support services and network) costs. The state and local school districts share, on an equal basis, funding for operational costs, equipment replacement, and upgrades.
Louisiana	25.0	The 1998 Legislature once again allocated monies for the Classroom-Based Technology Fund. This $25 million statutorily dedicated allocation is being used to continue efforts to carry out the State's Educationl Technology Goal, "All educators and learners will have access to technologies that are effective in improving student achievement." Funds are being used to purchase additional classroom computers, connect more classrooms to the Internet, purchase software to support curriculum, and provide additional technology tools needed to implement district and school technology plans. The funds are distributed to local school districts, special schools, and non-public schools. The Classroom-Based Technology Fund is supported solely by the state. Over the past three years, funding was provided annually from non-recurring sources.

State	Funding ($ millions)	Description of State Funding Program
Maine	0	Maine's Computers for Schools and Libraries Program is a program where surplus computers are donated by businesses and other organizations, refurbished by prison inmates, and distributed to schools and libraries. The distribution criteria are designed to offer refurbished computers to those schools determined to be least able to purchase new computers. The guidelines for the dispersal of computers related to schools are: (1) a goal of one computer for every six students, and (2) the basis for selection of schools is the school's e-rate percentage. Computers provided are "Internet-ready." The program is self-supporting: parts and supplies for refurbishing the computers are funded by a charge of $150 per computer to schools.
Maryland	5.4	The Education Modernization Initiative is an innovative program initially funded in fiscal 1997 that provides schools access to online computer resources and capacity for data, voice, and video equipment.
Massachusetts	nr[3]	In 1996, the Education Technology Bill authorized a $30 milliion matching grant program for school districts, with the intent of improving classroom connections to the Internet. By 1998, 90% of districts and charter schools had received grant awards. MassEd.Net provides state-subsidized unlimited Internet access service for Massachusetts teachers and administrators. The cost is $25 per year, which may be paid on behalf of their employees by local school districts. The Massachusetts Department of Education's Information Management System is currently in the late design phase. When fully implemented, it will provide enrollment, fiscal, testing, and other information from all school districts.
Michigan	0	No state aid provided.
Minnesota	28.0	The operating capital component of the general education revenue formula provides funding which can be used for technology or other equipment and facility needs. School districts are also permitted to use unrestricted general education revenue for technology. Categorical funding for technology is described below: 1) Interactive Television (ITV) Revenue ($6 million) may be used for the construction, maintenence, and lease costs of an interactive television system for instructional purposes. A district that has completed the construction of its ITV system may also purchase computer hardware and software used primarily for instructional purposes and access to the Internet, provided that its total approved expenditures must not exceed its ITV revenue for Fiscal Year 1998. All school districts located outside of the Minneapolis-St. Paul metropolitan area are eligible to participate. The maximum revenue is the greater of $25,000 or 0.5% of the district's ANTC. Beginning in 1999-2000, the ITV revenue will be phased out over a four-year period. The state aid is the difference between the ITV revenue and the ITV levy. A district's ITV levy equals the ITV revenue time sthe lesser of 1 or the ratio of the district's adjusted net tax capacity (ANTC) per weighted average daily membership (WADM) to $10,000. 2) Technology Grants ($22 million) provide one-time funding for several technology programs. 3) Telecommunications Access grants ($12.4 million) provide funding for telecommunications services to provide Internet access, data transmission, and interactive television capability to school districts and libraries. 4) Electronic Curriculum grants ($1.6 million) provide funding for development of curriculum and an electronic curriculum repository to be available as a teacher resource. 5) Technology Transformation grants ($1.2 million) fund projects that demonstrate the use of technology in support of Graduation Standards record keeping and information management. 6) Computer Refurbishment ($4.5 million) funding partnerships with business and non-profit organizations to refurbish computers for distribution to schools with the goal of increasing student access to technology. 7) Site-Based Technology Grants ($2.3 million) fund technology projects in support of learning that increases community ties.

State	Funding ($ millions)	Description of State Funding Program
Mississippi	nr	These funds were distributed to local school districts for compter hardware, equipment, and computer-based instructional programs based on grant proposals written at the local school district level.
Missouri	20.6	This funding is to implement computer network infrastructure for Missouri's public schools, provide computer access to the Department of Elementary and Secondary Education, and to improve the use of classroom technology.
Montana	0	The state provides funding to school districts for technology acquisition and the associated technical training for school district personnel. The source of the state funding is revenue from the sale of timber from state school trust lands. The revenue from any timber sales in excess of 18 million board feet is dedicated to schools for technology. Schools did not receive any monies from this funding source in the 1998-1999 school year due to an over-distribution of monies in the 1997-1998 school year. In general, the revenue source is projected to generate $9 per student annually for a school district.
Nebraska	0	The 1999 Unicameral Legislature passed Legislative Bill 386 that appropriates $3 million during 1999-2000 fiscal year and $3.075 million for 2000-2001 fiscal year for the use of technology in schools. Training and infrastructure support are targeted area for the dollars.
Nevada	28.7	Funding in 1998-1999 was $4.4 million (state and local combined). Funding for technology is provided for the following: updating library databases and licensing for publication; updating of school software and licenses; funding for satellite down links and bringing all Nevada schools to Level I technology use (i.e., a network capable computer in each classroom or its equivalent in computer laboratory stations). In addition, $28.7 million was appropriated for education technology on a one-time basis in 1998-1999.
New Hampshire	0	No state aid provided.
New Jersey	52.3	Distance Learning Network aid is a restricted aid program to support the acquisition and installation of technology with aid allocated on the basis of the number of pupils enrolled in the district multiplied by the cost factor of $41 per pupil in 1998-1999. Such aid may be used for equipment, wiring, access fees, software and supplies, professional development, staffing, maintenance, and other uses that may be necessary for the establishment of effective distance learning networks. The eight county special service school districts (disabled pupils only) receive $120,000 of this aid.
New Mexico	7.0	The 1998 Legislature provided funding for 1998-1999 of $14.02 per student with a total appropriation of $4.4 million. Districts budgeted a total of $3.2 (0.5% of total capital outlay revenues) in Technology for Education Act revenues for 1998-1999.
New York	43.5	New York state aids school technology through the following programs: 1) Computer Hardware and Technology Equipment Aid ($17.1 million): All districts are eligible for aid to purchase or lease computer and technology equipment for instructional purposes. Schools may use up to 20% of this aid for the repair of hardware and equipment or for staff development. 2) Computer Software Aid ($14.1 million): All districts are eligible for computer software aid to purchase instructional software. 3) Aid for Instructional Computer Technology ($9.0 million): This aid supports approved instructional computer technology expenses (those that are not eligible for Building Aid or are not claimed for any other technology aid). 4) Learning Technology Grants ($3.3 million): The state aids learning technology programs, including services benefitting nonpublic school students.

State	Funding ($ millions)	Description of State Funding Program
North Carolina	nr	The state of North Carolina began special funding for technology in 1995-1996. As of 1998-1999, $111.5 million have been dedicated to technology equipment and programs. Local school systems are required to write a Technology Plan which must be approved by the local board of education and submitted to the State Board of Education for final approval before money can be received. Plans must be reviewed annually.
North Dakota	0	No state aid. School districts could, with voter approval, levy up to 5 mills for distance learning technology.
Ohio	32.5	Significant investment in technology is made outside the basic aid and categorical aid to schools programs. For example, the Education Management Information System (EMIS) and Ohio Educational Computer Network (OECN) are used to provide administrative and instructional information technology and computer services for schools across the state. As well, the SchoolNet Plus program contains provisions for assistance in funding technology purchases.
Oklahoma	16.4	$16.4 million was distributed for common education classroom technology. Of that, $8.2 million went to help school districts obtain technology access (Internet capabilities, etc.) and another $8.2 million to purchase computer hardware.
Oregon	1.0	The state has no statewide technology plan. The Department of Administrative Services is devising a Technology Enterprise Network for all state agencies, including schools and higher education to begin in the 1998-2000 biennium. Through 1998-1999, all agencies and schools have developed their own plans for implementation. For the past 5 years the Education Service Districts have pooled resources with local districts and created a K-12 technology network that serves all schools in the state. Through this Oregon Public Education Network (OPEN) schools gain technology connectivity and access.
Pennsylvania	36.3	1998-1999 was the third year of the three-year Link-to-Learn program. Its purpose is to improve the basic technology infrastructure and capabilities of public elementary and secondary schools. Funding is provided for school districts and area vocational technical schools to assist them to: invest in the acquisition of new, or replacement of, obsolete, personal computers for use in classrooms; purchase cabling and equipment needed to install local area networks and wide area networks to position schools for eventual connection to the Pennsylvnia Education Network; and train teachers to integrate technology effectively into course curricula. The amount of Link-to-Learn grant is based on the average daily membership and market value/personal income aid ratio of the school district or area vocational technical school.
Rhode Island	3.4	The student technology investment fund is designed to provide schools and teaching staff with up-to-date educational technology and training to help students meet the demands of the 21st century. The program distributes an annual state allocation determined as part of the state budget process based on each district's average daily membership in grades pre-K to 12. Only 35% of the annual allocation can go to support ongoing activities, i.e., 65% of the allocation must support new technology activities. Funds may be used for curriculum development, professional development, and infrastructure requirements such as equipment, instructional materials, software and networking of systems. Each district must have (under a separate requirement) a technology plan, and use of these funds must be consistent with that plan. There is a legislative technology task force in place, which also must focus on closing student performance gaps. The Department of Education issues guidelines for and monitors the use of the fund.

State	Funding ($ millions)	Description of State Funding Program
South Carolina	28.4	State funding supports local implementation of the South Carolina Educational Technology Plan and district strategic and school renewal plans. Purchases consider issues projected in long-range plans such as the application of technology for teaching and learning. Funds may not be expended for personnel positions but may be used for contractual services. School technology funds are divided among all districts using the ratio of the district free/reduced lunch count for Grades 1-3 to the statewide free/reduced lunch count for Grades 1-3 of the second preceding year. Purchases must adhere to the following guidelines: 1) Provide for any lacking hardware, software or training needed to ensure extended connectivity to and usage of the dedicated telecommunications lines of the state network; 2) Focus on resources that facilitate integrated curriculum-based use of technology with correlation to curriculum frameworks and academic standards; 3) Supplement, but not supplant, the existing or projected school technology budgets; 4) Serve as seed money to stimulate technology innovation for Act 135; 5) Be supplemented or matched at the local level by entering into partnerships and arrangements with such groups as businesses and parent organizations and by using vehicle license plate sales, etc.; 6) Reflect equitable distribution of funds throughout the district; and 8) Match technologies to the local need, considering the fact that all technologies, video, computers, telecommunications, routers, DSUs, hubs, wiring, etc. are appropriate uses for these funds. Technology Professional Development Initiative. Expenditures made with these funds must have an emphasis on curriculum applications that support the South Carolina Educational technology Plan and must have a technology focus. Funds earmarked for technology Professional Development are divided among all school districts based on Averege Daily Membership (ADM). These funds must be used for graduate course contracts with South Carolina colleges and universities, instructor stipends for re-certification courses offered by districts, mini-course modules, and professinal development conference and workshop registration fees. This funding source may also be used to purchase instructional materials to support the courses and workshops offered in districts. They must center on weaving technology resources into daily instruction and on using them to support curriculum standards.
South Dakota	0	No state aid is provided.
Tennessee	20.0	Technology is one of the components of the Basic Education Program (BEP) cost formula. The districts are allowed to use the funds for any item considered "technology." The BEP provides 75% of the technology appropriation as provided in the formula based on $22.39 per average daily membership (ADM) until the fund is depleted.
Texas	nr	Beginning in 1992-1993, the Foundation School Program (FSP) included a technology allotment of $30 per average daily attendance (ADA). The technology allotment provides for the purchase of electronic textbooks or technology equipment for instruction, and it pays for training instructional personnel in the appropriate use of technology equipment and electronic textbooks. An "electronic textbook" means computer software, interactive videodiscs, CD-ROM, computer courseware, on-line services. The state also funds other technology initiatives such as the Texas Center for Educational Technology (TCET) located at the University of North Texas, the preview centers and training programs at the regional education service centers, the T-STAR telecommunications system, and the Texas Educational Telecommunications Network (TETN) that provides interactive video conferences, facsimile transmission, and two-way transmission of data. The Telecommunications Infrastructure Fund (TIF) was established in 1995 with the Public Utility Regulation Act. The Act was intended to generate $150 million each year to provide telecommunications access to schools, hospitals, libraries, *(continued on next page)*

State	Funding ($ millions)	Description of State Funding Program
Texas (continued)		and institutions of higher education. A TIF Board is charged with disbursing the funds. The mission of the TIF Board is to help Texas deploy an advanced telecommunications infrastructure by stimulating universal connectivity. In addition, the TIF Board funds training programs. During the 1996-1997 biennium, the TIF Board awarded $52 million to help schools implement Internet connections. In 1998-1999, the Texas Education Agency received $14.6 million in TIF funds for various technology projects. Although the TIF was structured to collect $150 million a year over 10 years, lower assessments on commercial mobile telecommunications lowered anticipated collections by $25 million per year. Legislation passed in 1997 removed the 10-year limit on deposits to the fund and placed a $1.5 billion cap on the fund, excluding interest and loan repayments. Half of the revenue is dedicated to public school projects, and the remaining half is available for other qualifying projects.
Utah	8.5	Utah's Educational technology Initiative is intended to expand the use of computer-based technologies within schools and classrooms for administrative and instructional use. The goal is to enhance the teaching/learning process and to empower students to become productive members of a technology-oriented society. Funds may be used to maintain existing programs and for inservice programs required to implement the technology. Allocations are made to all districts based on total average daily membership for grades K-12.
Vermont	na	State law requires "access to current technology", and funding is subsumed in the general state support grant and in the guaranteed yield. There was no state categorical appropriation in Fiscal Year 1999. In addition, Vermont Interactive Television sites allow for statewide teleconferencing for business, education, and other general purposes. The appropriation for this freestanding agency was $763,933. Most high schools are equipped for satellite reception of lessons with telephone feedback loops. These facilities were funded in an earlier fiscal year with one-time grants.
Virginia	1.0	The Electronic Classroom Program (also known as the Virginia Satellite Educational Network) created a satellite delivery network offering high school and middle school students credit courses that are not widely available, particularly in small or rural schools. Advanced placement courses in English, calculus, statistics, U.S. history, and government are offered in addition to three years each of Latin and Japanese. A number of staff development programs supporting Virginia's Standards of Learning are also offered to teachers.
Washington	na	Currently, there is no state K-12 general fund category specifically earmarked for technology. Instead, the Washington State Department of Information Services is responsible for coordinating the development of the state's K-20 network. This is a high-speed, high-bandwidth network that connects Internet, videoconferencing, and satellite-delivered video programs. The effort is a collaboration of public and private K-12 schools, higher education, state government and the private sector which builds on an existing state-run telecommunications infrastructure. Since 1996, the state has appropriated $62.3 million to construct the network. Phase one was completed in September 1997 at a cost of $23.2 million. Phase one connected the main campuses of the state's higher education system and the nine regional education service districts. Phase two began in July 1998 and will connect the state's K-12 school districts, with an anticipated completion date in the year 2000. Subsequent phases will add public libraries, state and local governments, and community resources centers to the network. In addition to the K-20 network, the Superintendent of Public Instruction sponsors a number of competitive grant awards for innovative uses and technology, and also assists districts in developing the local technology plans required for districts in order *(continued on next page)*

State	Funding ($ millions)	Description of State Funding Program
Washington (continued)		to qualify for the federally-sponsored e-rates. State share is 100% of allocation for the K-20 network. Beginning in 1999-2000, a general fund category for the costs of the K-12 portion of the K-20 network will be added.
West Virginia	22.0	The Basic Skills/Computer Education program is an on-going initiative, providing hardware and software for every K-6 classroom in the state. Currently, 29,000 student workstations are in use, and 21,000 teachers have received training. The program was initiated in 1989 when the West Virginia Legislature requested that computer hardware, software and training for grades K-6 be implemented to improve basic skills.
Wisconsin	47.4	Public school districts are eligible to receive Technology Block Grants administered by the Technology for Educational Achievement in Wisconsin (TEACH) Board. The grants may be used for any purpose related to technology use in the education or training of any person or in the administration of a school and related telecommunications services, except for the funding of salaries or benefits of any school district employee. Of the total, $30 million of the funding is distributed based on a formula that uses equalized value per member. Each eligible school district receives $5,000 from the amount appropriated. The balance of the $30 million is distributed in proportion to a weighted membership of each district. The remaining $5 million is distributed based on the number of persons residing in the district between the ages of 4 and 20.
Wyoming	nr	Technology is considered to hold promise for improved student knowledge, especially in Wyoming's small remote schools. In addition to including a school finance model component providing per student equipment funding within the total block grant amount, the legislature has provided incentive payments for the foundation program account for programs involving distance learning technology, as well as significant funding, $11 million over a two year period, for implementation of the Wyoming Education Technology Plan. The Plan provides a structure for implementing and integrating technology into educational programs, with data connectivity between all schools to be accomplished as of July 1, 1999, and interactive two-way video capability within all high schools by July 1, 2001. Funding is phased-in over time to accomplish these goals. Technology is also addressed through a technology readiness factor included within the statewide assessment of school building and facility needs used in prioritizing statewide capital construction needs. The readiness component assesses the existence of required building and facility infrastructure to support informational technology and associated equipment.

Source: Compiled from Catherine C. Sielke, John Dayton, C. Thomas Holmes, and Anne Jefferson, *Public School Finance Programs of the United States and Canada, 1998-1999*, Publication #NCES 2001-309 (Washington, D.C.: U.S. Department of Education, National Center for Education Statistics, 2001) http://www.nces.ed.gov/edfin/state_finance/statefinancing.asp.

[1] In Delaware, Division I is the primary component that is determined by enrollment, through a unit (primarily the equivalent of the number of students per staff) funding system. It drives the allocation of personnel (weighted units based on Average Daily Membership) that eventually determines the primary component of funding depending on a state salaries and benefits scale. In 1998-1999, this fund provided nearly 76% of total state appropriations to districts, which pays roughly 70% of all districts' personnel expenditures, ranging from teaching to administrative to support staff. The second component of the formula, Division II, funds all other school costs (excluding transportation and debt service) such as material, supplies, and energy costs. Those funds are flat grants based on "units" of enrollment. The third component, Division III, is an equalizing factor used to compensate for funding disparities between property rich and poor districts.

[2] Not applicable (na).

[3] No reported (nr).

The Year Round Calendar: An Analysis of Student Outcomes

Kimberly Moore and Deborah A. Verstegen

Introduction

Almost a decade ago, the National Education Commission on Time and Learning warned Americans that schools were unable to meet the demands of a new global economy. For 150 years, schools had operated on schedules that suited only the top students, while average and poor students simply dropped out to make decent livings on farms or in factories. However, the days when most non-skilled or semi-skilled workers could find productive work are over:

> The reality of today's world is that the global economy provides few decent jobs for the poorly educated. Today, a new standard for an educated citizenry is required, a standard suited to the 21st century, not the 19th or the 20th. Americans must be as knowledgeable, competent, and inventive as any people in the world. All of our citizens, not just a few, must be able to think for a living. Indeed, our students should do more than meet the standard; they should set it. The stakes are very high. Our people not only have to survive amidst today's changes, they have to be able to create tomorrow's.[1]

Therefore, given that students learn at different rates and in different ways, it appears that schools must change their "one size fits all" mentality. One area that has remained constant over the past century despite numerous social changes is the school calendar. If all students must now achieve high levels of education, schools must accommodate the differences in time needed for various students to acquire the same knowledge and skills. The Commission also noted: "In the school of the future, learning–in the form of high, measurable standards of student performance–must become the fixed goal. Time must become an adjustable resource."[2]

Some children enter school at a disadvantage. Poverty, being a non-native speaker, attending under-funded schools, and summer learning loss are often cited as reasons why some children fail to achieve high standards of learning.[3] Despite these challenges, though, it is argued that all students need to achieve to high levels in order to compete in an increasingly global economy. To improve academic outcomes, many educators, administrators, and others have been searching for new ideas that will encourage student achievement. One possibility that has waxed and waned over the last 100 years is year round education.

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Although the name suggests that students never get a break from being in classrooms, year round schools do not require an increase in the number of mandatory days of attendance. Instead, several mini-vacations are scheduled throughout the year, usually with a three to six-week break in the summer instead of a long three-month summer vacation. Also, optional days are often added during the vacations to form a block of added instruction termed "intersessions," where students who would benefit from remediation or acceleration can receive extra help. Intersessions can add as many as 15 to 60 extra days to the school calendar and are often well attended when a school chooses to institute them.[4]

In addition to entering school at a disadvantage, students on a traditional schedule who experience difficulties must often wait an entire school year to receive remediation through summer school. Advocates for year round schooling, such as Charles Ballinger,[5] argue that it makes no sense to have a struggling student flounder during the entire year when a year round calendar with intersessions can offer quick and frequent remediation. For some schools, adopting a year round calendar has reduced student drop-out rates and increased student achievement.[6]

This study examines the learning differences of students in a year round versus an academic year program. Specifically, it addresses the effects of a year round calendar not only on general education students, but also on children in poverty. Does a year round calendar curb summer learning loss that many children in poverty experience? What are the differences in cognitive outcomes for students in a year round program and those in a regular, academic year program? These questions are addressed using data from an elementary school in the Southeast. First, the literature is reviewed, and the methodology is discussed. Then the study results and findings are presented. The final sections include conclusions and implications for practice and research.

Review of the Literature

Students' forgetting information over the summer is a frequent reason cited for instituting a year round program.[7] Although there is some disagreement about how serious the loss of learning is during the summer, most researchers acknowledge the phenomenon and believe it is a problem.[8] In fact, summer learning loss can be particularly detrimental to disadvantaged students, who lose significantly more knowledge than their middle-class and upper-class peers.[9]

After describing in detail studies on summer learning loss, Debra Viadero (1994) concluded: "While learning slows down for all students when school is out, a small but growing number of studies shows that it practically grinds to a halt for those who come from disadvantaged homes."[10] To support her claim, Viadero cited a 1972 study where Barbara Heyns, a sociology professor at New York University, tracked 3,000 sixth and seventh-graders for two years in Atlanta. After controlling for socioeconomic status and interviewing 500 students on how they spent their summers, Heyns compared May and October standardized test scores. She found that although learning slowed over the summer, advantaged students made gains over the summer while disadvantaged students gained no additional learning or lost learning. Poor children tended to narrow the learning gap during the school year, but the gap between poor and wealthy students widened again over the summer.

In 1982, Doris Entwistle, Karl Alexander, and Linda Steffel Olson began a longitudinal study of 790 Baltimore students, beginning in

first grade and continuing through high school graduation and beyond. In this study, Entwistle, Alexander, and Olson determined that low socioeconomic students entered the first grade earning lower scores on California Achievement Tests than high socioeconomic students, but both groups learned at the same rate during the school months. During the first grade, students from low socioeconomic families gained 57 points in reading and 49 in math. Similarly, first-grade students from families of high socioeconomic status gained 61 points in reading and 45 points in math during the year. However, summers tended to produce an achievement gap that adversely affected low socioeconomic children. The summer after the first grade, children from high-income families continued to improve academically with an increase of 15 points in reading and 9 points in math, but children from low-income families lost 4 points in reading and 5 points in math. Entwistle, Alexander, and Olson attributed this difference to the activities that young children from different socioeconomic classes experienced in the summer. Although summer school may seem like a good method for decreasing the learning gap between poor and affluent students, summer schools have actually increased the gap because they have not been specifically designed to meet the needs of low-income children.[11] Describing the children and families in their longitudinal study, Entwistle, Alexander, and Olson concluded that summer activities varied by socioeconomic level, stating:

> In summers when they were in the first few grades, the low-income children were also less likely to go to state or city parks, zoos, science centers, fairs, or carnivals; to take trips and vacations; to borrow books from the library; to play sports; or to take music or dance lessons. In particular, the number of books children read and their use of the public library over the summer both correlate significantly with socioeconomic status.[12]

Since former U.S. Secretary of Education William Bennett's endorsement of a four-quarter year round calendar in 1986, a number of studies have been conducted to compare the academic performance between year round students and students on a traditional calendar. Although the research is inconclusive, several studies have supported increased academic gains for year round students.

After citing about a dozen studies that support academic improvement for year round students, Shields and Oberg[13] outlined their own comparative study of fifth graders in eight urban schools in Utah. From 1990 to 1995, Shields and Oberg analyzed Stanford Achievement Test scores in mathematics, reading, language, science, and social studies of fifth-graders in two single-track, three traditional, and three multi-track schools. After the schools were matched according to socioeconomic status, programs offered, and administrators' tenure and background, the researchers compared the Stanford Achievement Test scores. Using a t-test, Shields and Oberg found significantly higher reading scores among the multi-track students in 1994. The other mean scores (in mathematics, language, science, and social studies) were higher in the year round schools but were not statistically significant. Also, over the six-year period, 21% of the students in the traditional schools scored below their predicted range, while only 4% of the year round students fell below the predicted range. After all of the programs had been stable for two years, 14% of the students in traditional schools were still below their predicted range, whereas only 1% of the year round students were below their predicted range.

Twenty years after adopting a multi-track, year round program (a system where all students are divided into groups and at least one group is always on vacation) in six elementary schools, administrators of the San Diego Unified School District requested an overall review of the year round programs in their district. By the 1991-1992 school year, the district had 25 single-track and 12 multi-track schools in operation. Using scores on the California Tests of Basic Skills (CTBS), Alcorn[14] compared academic performance on seven tests in mathematics, reading, and language for fifth graders. The district objective for fifth grade was that "CTBS median percentile ranks will be maintained or improved on a minimum of 5 of 7 tests."[15] The evaluation included 17 single-track, 15 multi-track, and 73 traditional schools, and the testing period was from 1982 to 1990. During this time, 87% of the year round schools met the district objective (94% of the single-track and 80% of the multi-track schools), but only 71% of the traditional schools met the district's objective.[16] In addition to reviewing fifth-grade test scores, Alcorn studied third and sixth-grade California Assessment Program (CAP) scores in reading and math during the same testing period. In each case, year round schools outperformed traditional schools by three to six percentage points. When Alcorn further divided the CAP scores and reviewed mathematics, language, and reading scores at three testing intervals (one year, three years, and six years), he found that out of 27 comparisons, year round schools outperformed traditional calendar schools 17 times, traditional schools outperformed year round schools one time, and nine times there was no significant difference in scores.[17]

Method

This study employed a quasi-experimental comparative design that investigated the academic outcomes of a voluntary year round program implemented at an elementary school in the Southeast. Data from the 1999-2000 and 2000-2001 school years were compared between year round and traditional calendar students attending the same school. The specific sources analyzed were the Standards of Learning (SOL) test scores in mathematics, English reading and writing, science, and social studies; and Stanford 9 Achievement Test scores in mathematics, language, reading, science, and social studies. The SOL is the state's criterion-referenced test; the Stanford 9 is a nationally norm-referenced test.

The following questions were addressed: (1) What are the characteristics of a year round program and student attendees? (2) Do students who participate in a voluntary year round program perform better on achievement tests than do students in the same school who remain on a traditional, nine-month calendar? (3) Do low-income students in a year round program benefit more than their wealthier peers as measured by achievement test scores? (4) What factors account for differences in achievement test scores, and how do they compare for students on different calendars?

Results and Findings

What are the characteristics of a year round academic program and students who participated in it?

Woodridge Elementary School is an inner-city school in central Virginia that serves children in kindergarten through fourth grade. Many of the children come from low-income homes, with 59% of the children qualifying for free or reduced-price lunch during the 2001-2002 academic year. Prior to the beginning of a new academic year, parents

are given the option of enrolling their children in the year round or traditional calendar program and may switch from the previous year's calendar if they would like. Approximately one-third of the student body attended school on the year round calendar in its fourth year of implementation.

Since its second year of implementation, the year round calendar has retained a consistent structure. The year round calendar, like the traditional calendar, provides 182 mandatory school days. Different from the traditional calendar, however, are two optional five-day intersessions, one in the fall and one in the late winter. The ten additional intersession days are full days and provide year round students with a total of 192 possible days of instruction. Although attendance for the intersession days is optional, participation has been very high with almost 100% of the third and fourth graders attending at least one intersession day. Many attend all intersession days.

Students enrolled in the year round program begin school at the beginning of August, approximately one month before the traditional students return. Except for a couple of teacher workdays, the students attend classes for eleven weeks and then have a two-week break, where the first week is a scheduled intersession, and the second week is vacation. During intersessions, students review and practice academic skills taught during the year in a camp-like environment that focuses on enjoyable topics like travel or cooking. Because the year round program at Woodridge is single-track, all students and teachers are off school during the week after intersession. The next 13 to 14 weeks are a bit broken up due to Thanksgiving and Christmas holidays, which are the same scheduled days off as the traditional calendar. Again, the two-week break after these weeks of classes consists of the first week being an optional intersession and the second week being a vacation for year round students and staff. The final 13 weeks are interrupted by a week for spring break and end in the middle of June. Because the summer intersession was poorly attended during its first year of operation, the school dropped the third intersession from the successive years. The year round students then have a summer break that is approximately six weeks long before returning to school in early August.

Besides differences in the calendar, the programs and curriculum (excluding intersessions) offered to the year round and traditional students were identical. Both year round and traditional classes used the same curriculum, class sizes were similar with approximately 15 to 18 students in each class, and the teachers' level of education and years of experience were roughly the same.

Student Populations

Before comparing test score data, the year round and traditional calendar populations for the 1999-2000 and 2000-2001 academic years were compared according to the following demographic characteristics: socioeconomic status, gender, ethnicity, special education, gifted education, and family structure. In Table 1, the only area where year round and traditional calendar third-graders were similar was ethnicity. Both groups were composed of approximately one-third Caucasian and two-thirds African-American students. The year round population was composed of 33.3% Caucasian and 60.6% African-American students, and the traditional calendar population included 30.4% Caucasian and 59.8% African-American students. One area of difference between the two groups was socioeconomic status, as measured by the qualification for free and/or reduced-price lunch. Traditional calendar, third-grade students were more likely to qualify for free or reduced-price lunch than their year round peers. With more than a 20 percentage-point

difference, only 42.4% of the year round students qualified for free and/or reduced-price lunch, whereas 67.0 % of the traditional students qualified for free and/or reduced-price lunch. Year round students also were more likely to live with two parents than traditional calendar students. While 48.5% of the year round students lived with two parents and 48.5% lived with one parent, only 37.5% of the traditional calendar students lived with two parents whereas 58.0% lived with one parent.

Table 1

Combined 1999-2000 and 2000-2001 Demographics for Third Grade

Indicator	No.	%	No.	%	Total Number of Students
Indicator of SES	**Neither Free nor Reduced Lunch**		**Free and Reduced Lunch**		
Year-Round	(19)	57.6%	(14)	42.4%	33
Traditional	(37)	33.0%	(75)	67.0%	112
Gender	**Male**		**Female**		
Year-Round	(19)	57.6%	(14)	42.4%	33
Traditional	(52)	46.4%	(60)	53.6%	112
Ethnicity	**Caucasian**		**African-American**		
Year-Round	(11)	33.3%	(20)	60.6%	31*
Traditional	(34)	30.4%	(67)	59.8%	101*
Special Education	**Yes**		**No**		
Year-Round	(3)	9.1%	(30)	90.9%	33
Traditional	(25)	22.3%	(87)	77.7%	112
Gifted	**Yes**		**No**		
Year-Round	(7)	16.1%	(26)	83.9%	33
Traditional	(17)	7.1%	(95)	92.9%	112
Student Lives With	**Both Parents**		**One Parent**		
Year-Round	(16)	48.5%	(16)	48.5%	32*
Traditional	(42)	37.5%	(65)	58.0%	107*

Note: *Ethnicity may not equal 100%. Students classified as "other" comprise the missing students.

The percentages of students qualifying for special education also differed with 22.3% of the traditional calendar population and 9.1% of the year round population receiving services. One reason for the higher percentage of traditional calendar students qualifying for special education is that special-education students in self-contained classrooms are not given a choice between the traditional and year round calendar. However, there is no similar reason to explain why there is more than twice the percentage of gifted students in the year round program than in the traditional calendar program (16.1% and 7.1% respectively).

One final difference between the two populations of third-grade students is gender. In the year round program, there are more boys than girls (57.6% and 42.4% respectively). However, these numbers are almost reversed for the traditional calendar program with girls outnumbering the boys (53.6% and 46.4% respectively).

In many ways, the fourth-grade demographics for year round and traditional calendar students during the 1999-2000 and 2000-2001 school years (Table 2) are similar to the demographics for the third-grade students. Like the third-grade student demographics, more males (54.8%) attended the year round program than females (45.2%), and more females attended the traditional calendar program (52.5%) than males (47.5%). Also, there continued to be somewhat similar percentages for ethnicity between the year round and traditional calendar programs, with about one-third Caucasian and two-thirds African-American students (29.0% and 33.3% Caucasians, and 64.5% and 58.6% African-Americans). Other similarities between the third and fourth grade populations include the differences in special and gifted education. Again, special education percentages were larger for the traditional calendar population, while the gifted education percentages were higher for the year round population. The percentage of year round students qualifying for special education services was 12.9%, and the percentage of traditional calendar students qualifying for special education services was almost twice as large at 25.3%. As stated earlier, the larger percentage of special education students in the traditional program was expected given that students in self-contained special education classes did not have a choice between year round and traditional calendars. However, the gifted population was larger in the year round program than the traditional calendar program with 16.1% of the year round students qualifying for gifted education but only 7.1% of the traditional calendar students qualifying for gifted education.

One key difference between the third and fourth-grade populations for the 1999-2000 and 2000-2001 school years was socioeconomic status as measured by free and reduced-price lunch. Unlike the third-grade population where the year round students were more likely not to qualify for free or reduced-price lunch, the fourth-grade year round students were much more likely than their traditional peers to qualify for free or reduced-price lunch. Of the year round students, 71.0% qualified for free or reduced-price lunch, but only 59.6% of the traditional calendar students qualified for free or reduced-price lunch. Another difference between the third and fourth grade populations was family structure. While the third grade year round students were more likely to live with two parents than traditional calendar students, the fourth grade year round students were quite similar to traditional calendar students in this respect, with 32.3% of the year round students living with two parents and 36.4% of the traditional students living with two parents.

Table 2
Combined 1999-2000 and 2000-2001 Demographics for Fourth Grade

Indicator	*No.*	*%*	*No.*	*%*	*Total Number of Students*
Indicator of Poverty-SES*	**Neither Free nor Reduced Lunch**		**Free and Reduced Lunch**		
Year-Round	(9)	29.0%	(22)	71.0%	31
Traditional	(40)	40.4%	(59)	59.6%	99
Gender	**Male**		**Female**		
Year-Round	(17)	54.8%	(14)	45.2%	31
Traditional	(47)	47.5%	(52)	52.5%	99
Ethnicity	**Caucasian**		**African-American**		
Year-Round	(9)	29.0%	(20)	64.5%	29*
Traditional	(33)	33.3%	(58)	58.6%	91*
Special Education	**Yes**		**No**		
Year-Round	(4)	12.9%	(27)	87.1%	31
Traditional	(25)	25.3%	(74)	74.7%	99
Gifted	**Yes**		**No**		
Year-Round	(5)	16.1%	(26)	83.9%	31
Traditional	(7)	7.1%	(95)	92.9%	99
Student Lives With	**Both Parents**		**One Parent**		
Year-Round	(10)	32.3%	(20)	64.5%	30*
Traditional	(36)	36.4%	(60)	60.6%	96*

Note: *Socioeconomic Status. Numbers may not equal 100%. Students classified as "other" comprise the missing students.

Thus, the differences in populations may affect study findings in important ways when grade levels are considered separately, particularly because of differences in special education and low income populations. However, these variations are moderated somewhat when data are considered across both grade levels, with the exception of special education status, which is higher for children on the traditional calendar.

Table 3

Compilation of Test Comparisons Between Year-Round and Traditional-Calendar Students

Test	N	Mean	Std. Dev.	T	Sig. (2-tailed)	Mean Diff.
SOL Math						
Year-Round, all	35	431.74	102.43	-2.022	.045	-35.82
Traditional, all	95	395.93	84.48			
SOL History/S.S.						
Year-Round, all	35	428.11	68.35	-2.465	.015	-30.59
Traditional, all	95	397.53	60.61			
SOL History/S.S.						
Year-Round, Always	19	443.21	76.787	-2.942	.004	-46.76
Traditional, Always	82	396.45	58.755			
SOL Math						
Year-Round, Always	19	452.21	112.011	-2.293	.024	-51.58
Traditional, Always	82	400.63	82.155			
SOL English						
Year-Round, Always	19	432.53	99.519	-1.895	.061	-33.59
Traditional, Always	82	398.94	60.998			
SOL Math						
Year-Round, H. SES	19	471.74	103.66	1.983	.053	52.42
Traditional, H. SES	35	419.31	86.43			
SOL History/S.S.						
Year-Round, H. SES	19	455.84	71.68	1.905	.062	38.84
Traditional, H. SES	35	417.00	71.47			
Stanford 9 Math						
Year-Round, L. SES	21	594.19	36.90	2.081	.041	17.44
Traditional, L. SES	53	576.75	30.62			
Stanford 9 Math						
Year-Round, Males	16	597.56	35.40	1.839	.071	19.23
Traditional, Males	42	578.33	35.66			
SOL History/S.S.						
Year-Round Females	16	444.81	73.35	2.181	.033	39.85
Traditional Females	52	404.96	60.85			
SOL Math						
Year-Round, White	12	490.42	1-7.85	2.241	.015	-30.59
Traditional, White	30	416.73	91.48			
SOL Science						
Year-Round, White	12	471.33	80.41	1.822	.076	44.95
Traditional, White	30	426.38	68.24			
SOL English						
Year-Round, White	12	464.67	130.70	1.705	.096	27.84
Traditional, White	30	417.20	71.30			

Table 3 (continued)

Compilation of Test Comparisons Between Year-Round and Traditional-Calendar Students

Test	N	Mean	Std. Dev.	T	Sig. (2-tailed)	Mean Diff.
Stanford 9 S.S.						
Year-Round, White	9	610.78	53.60	1.907	.065	13.69
Traditional, White	28	584.68	28.33			
Stanford 9 Reading						
Year-Round, Sp. Ed.	5	558.00	23.47	-2.346	.030	17.32
Traditional, Sp. Ed.	16	598.63	36.05			

Comparisons Between Programs

For this study, scaled scores on third-grade Virginia SOL tests in English reading and writing, math, science, and history/social studies and scaled scores on the fourth-grade Stanford 9 Achievement Tests in reading, math, language, science, and social studies were compared between the year round and the traditional calendar students. The descriptive statistics reported included means and standard deviations. A t-test with a $p \leq .05$ was also used to determine the likelihood of differences being due to chance. However, because scores from the entire population, rather than a random sample, were analyzed, any difference is considered to be educationally significant.

In addition to comparing the groups as a whole, the following subgroups were compared:

- students who attended the year round program each year since the program's inception in 1998 versus students who never attended school on a traditional calendar;
- wealthy versus poor students;
- groups based on individual characteristics disaggregated by gender, ethnicity, special education and gifted education status; and
- children in single versus two parent families.

Findings

The first part of the analysis compared the Stanford 9 and SOL test scores for all year round and traditional calendar students without concern for demographic make-up. As shown in Table 3, at the $p \leq .05$ significance level, year round students outperformed their traditional calendar peers on SOL mathematics and history/social science tests. In mathematics, the mean difference was significant (t = –2.022, p $\leq$ .045). Year round students outperformed their traditional peers by 35.82 points with a year round mean of 431.74 and a traditional mean of 395.93. Also in history/social science, the mean difference was significant (t = -2.465, p $\leq$ .015). Year round students again outperformed their traditional peers by 30.59 points with a year round mean of 428.11 and a traditional mean of 397.53.

In addition to these overall comparisons, scores for students who had been in the year round program since its inception in the fall of 1998 were compared with the scores of students who had never participated in the year round program. In this comparison, students who had attended year round since its inception had higher mean scores for all SOL sub-tests and for every Stanford 9 sub-test except science. There were significant SOL test score mean differences favoring year round for history/social science (t = 2.942, p $\leq$ .004) and mathematics

(t = –2.293, p $\leq$ .024), and year round students almost met the p $\leq$ .05 significance level requirement for English reading and writing (t = –1.895, p = .061). For the SOL history/social science test, the year round students outperformed their traditional calendar peers by 46.76 points with a year round mean of 443.21 and a traditional mean of 396.45. For the SOL mathematics test, the year round students outperformed the traditional calendar students by 51.58 points with a year round mean of 452.21 and a traditional mean of 400.63. Finally, for the SOL English reading and writing test, the year round students again outperformed the traditional calendar students by 33.59 points with a year round mean of 432.53 and a traditional mean of 398.94.

The second part of the analysis compared the Stanford 9 and SOL test scores for poor and affluent year round and traditional students (as measured by qualifying for free and/or reduced-priced lunches). Affluent year round students came close to outperforming their traditional calendar peers on the SOL mathematics (t = 1.983, p = .053) and history/social science (t = 1.905, p $\leq$ .062) tests. Year round students scored higher on the SOL mathematics test than their traditional calendar peers by 52.42 points with a year round mean of 471.74 and a traditional mean of 419.31. On the history/social science SOL test, year round students again scored higher than the traditional students by 38.84 points with a year round mean of 455.84 and a traditional mean of 417.00. For those in poverty, year round students significantly (t = 2.081, p$\leq$ .041) outperformed traditional calendar students on the Stanford 9 mathematics tests. Year round students outperformed traditional students by 17.44 points with a year round mean of 594.19 and a traditional mean of 576.75.

In addition to these comparisons, year round and traditional high and low socioeconomic (as defined by the qualification for free lunches) students' test scores were compared within each group: traditional and year round calendar. Table 4 lists the significant differences on the Stanford 9 sub-test comparisons. Overall, year round high and low socioeconomic students had significant mean differences in only two areas, reading (t =2.616, p $\leq$ .016) and science (t = 2.628, p $\leq$ .013), whereas traditional high and low socioeconomic students had significant mean differences on all of the Stanford 9 sub-tests. The most noticeable comparison that indicates that the year round test score gap between high and low socioeconomic students was smaller than the traditional test score gap between high and low socioeconomic students was on the Stanford 9 mathematics comparison. While the traditional high and low socioeconomic students had significantly different means on the Stanford 9 mathematics sub-test (t = 4.030, p $\leq$ .000) with a mean difference of 36.21 points favoring high

Table 4

Compilation of Stanford 9 SES Comparisons

Test	N	Mean	Std. Dev.	T	Sig. (2-tailed)	Mean Diff.
Stanford 9 Reading						
Y-R High SES	8	643.75	59.708	2.616	.016	48.95
Y-R Low SES	15	594.80	30.957			
Stanford 9 Science						
Y-R High SES	19	449.16	77.423	2.628	.013	63.62
Y-R Low SES	13	385.54	48.117			
Stanford 9 Reading						
Trad. High SES	34	631.97	42.386	4.160	.000	32.69
Trad. Low SES	47	599.28	28.351			
Stanford 9 Math						
Trad. High SES	34	609.82	50.863	4.030	.000	36.21
Trad. Low SES	47	573.62	29.640			
Stanford 9 Lang.						
Trad. High SES	34	597.53	41.741	3.765	.000	26.85
Trad. Low SES	47	570.68	21.742			
Stanford 9 Science						
Trad. High SES	34	640.91	39.463	4.925	.000	37.06
Trad. Low SES	47	603.85	28.311			
Stanford 9 S./S.						
Trad. High SES	34	597.53	27.324	3.695	.000	23.00
Trad. Low SES	47	574.53	27.871			

socioeconomic students, the year round high and low socioeconomic students did not have significantly different means on the Stanford 9 mathematics sub-test (t = .284, p ≤ .779). High and low socioeconomic year round students had a mean difference of only 5.38 points on the Stanford 9 mathematics test.

Given the test comparisons for year round and traditional high and low socioeconomic students, the year round calendar may have helped poorer students academically perform closer to the same level as their wealthier peers in mathematics as measured by the Stanford 9 mathematics sub-test. For the tests where the year round mean differences were larger than the traditional mean differences, the year round mean differences were less likely to be significant (p ≤ .05), another indicator that the test-score gap between affluent and poor students was less significant for year round students.

The last part of the analysis compared Stanford 9 and SOL scores for year round and traditional calendar students based on various demographic characteristics. First, gender was compared. For males, none of the Stanford 9 or SOL tests had a significant mean difference, although Stanford 9 mathematics scores for year round students were close (t = 1.839, p = .071). Year round males scored an average of 19.23 points higher on the mathematics Stanford 9 than traditional calendar students with a year round mean of 597.56 and a traditional mean of 578.33. For females, SOL history/social science year round scores were significantly higher than traditional calendar students'

scores (t = 2.181, p ≤ .033). Year round females scored an average of 39.85 points higher than traditional females did. The year round mean was 444.81, and the traditional mean was 404.96).

Year round Caucasian students had a significant positive mean difference on the SOL mathematics test (t = 2.241, p ≤ .031) and came close to the p ≤ .05 significance level on the SOL science (t = 1.822, p = .076) and English (t = 1.705, p = .096) tests and on the Stanford 9 social science test (t = 1.907, p = .065). Year round Caucasian students outperformed their traditional peers on the SOL mathematics test by 73.68 points with a year round mean of 490.42 and a traditional mean of 416.73. On the SOL science test, year round Caucasian students outperformed their traditional peers by 44.95 points with a year round mean of 471.33 and a traditional mean of 426.38. On the SOL English reading and writing test, year round Caucasian students outperformed traditional Caucasian students by 47.47 points with a year round mean of 464.67 and a traditional mean of 417.20. On the Stanford 9 social science test, year round Caucasian students outperformed traditional Caucasian students by 26.10 points with a year round mean of 610.78 and a traditional mean of 584.68. For African-Americans, there were no significant mean differences for any of the Stanford 9 or SOL tests. Whether or not a student lived with one or two parents did not seem to affect test scores. There were no significant mean differences for any of the Stanford 9 or SOL tests.

For special education, there was a significant mean difference between year round and traditional students' Stanford 9 reading scores (t = −2.346, p ≤ .030). Unlike the other mean differences, this difference favored traditional calendar students. Traditional special education students outperformed the year round special education students by 40.63 points with a traditional mean of 598.63 and a year round mean of 558.00. When interpreting the special education t-tests, it is important to take into account that the special-education populations were very small (only seven third and fourth grade year round special education students in two years), that this study did not separate students based on types of disabilities, and that self-contained special education students could not choose to participate in the year round program. Finally, being gifted did not seem to affect test scores. There were no significant mean differences for any of the Stanford 9 or SOL tests.

Conclusions

Before drawing conclusions from the data, it is important to reiterate that it is impossible to control all intervening variables. Even though several variables were controlled (socioeconomic, gender, ethnicity, special education, giftedness, and family structure), there may be other variables that account for the differences in year round and traditional calendar test scores. Despite the possibility of intervening variables, some conclusions can still be suggested. As a whole, the year round program at Woodridge seems to have had a positive academic effect on mathematics and history/social science, as measured by t-tests of the difference in means on Stanford 9 and SOL achievement tests. For mathematics, there was a significant mean difference (p ≤ .05) favoring year round students in three different SOL test comparisons (all year round third graders, third graders who have been in the year round program since its inception, and Caucasians). Importantly, there was a significant mean difference (p ≤ .05) favoring year round students on the Stanford 9 mathematics test for low socioeconomic students. Additionally, for the general population, twice the year round students came close to outperforming traditional students at the p ≤ .05 level on the mathematics tests. On the SOL mathematics test, high socioeconomic year round students outperformed traditional students at the p ≤ .053 level, and on the Stanford 9 mathematics test, year round males outperformed traditional males at the p ≤ .071 level.

On five different history/social science tests, year round students outperformed traditional students at or near the p ≤ .05 level. For the SOL history/social science tests, there was a significant mean difference (p ≤ .05) favoring year round students in three different comparisons (all year round third graders, third graders who have been in the year round program since its inception, and females). In two other history/social science tests, the mean difference favoring year round students was close but not at p ≤ .05. High socioeconomic year round students outperformed traditional high socioeconomic students on the SOL history/social science test with a p = .062. Caucasian year round students outperformed Caucasian traditional calendar students on the Stanford 9 social science test at the p = .065 level.

Although there were a few other test comparisons that favored year round students near the p ≤ .05 level (SOL science and English for Caucasians and SOL English for students in the year round program since its inception), mathematics and history/social science were the tests that continually showed significant year round results.

It is interesting to note that traditional students outperformed year round students only once at the p ≤ .05 level. This outcome in favor of the traditional special-education students occurred on the Stanford 9 reading sub-test. Although it appeared on the surface that Woodridge's year round program had a negative effect on reading for special education students (as measured by the Stanford 9), there were a few possible reasons why this result may not have been due to the year round program itself. First, the special education populations were very small. Second, there was no differentiation between different exceptionality in this study. Third, self-contained students did not have the choice to participate in the year round program. Also, it is important to emphasize that this result is inconsistent with the other comparisons done in the study.

Finally, the test-score gap between poor and more affluent year round students appears to be closing with year round schooling. This is a critical finding. When the test scores of high and low socioeconomic students were compared according to year round and traditional calendars, the year round students had fewer significant mean differences between the poor and more affluent students' scores within their group. What was most noticeable was the difference in Stanford 9 mathematics scores. For the year round students, there was only a 5.38-point difference in the average scores between the more affluent and the poor students, and the t-score was not even close to significance (t =.284, p = .779). Conversely, the traditional students had a 36.21 mean difference between the poor and wealthier students, and that difference was significant (t = 4.030, p ≤ .001).

Except for two cases, comparisons that were statistically significant at the p ≤ .05 level were SOL test comparisons. These results seem logical given that Virginia's SOL tests are supposed to be aligned with the curriculum being taught in Virginia's schools. Stanford 9 tests are assessments given all over the country and are not necessarily accurate tools for assessing the specifics of what is being taught in a particular school.

Implications for Practice and Research

Given that schools are becoming increasingly accountable for student learning by state and federal governments, it is becoming increasingly important that effective investments in interventions that hold promise of raising the level and distribution of outcomes for all students be identified and targeted. Year round education is one possible option for increasing student achievement.

For Woodridge Elementary School, the modified year round calendar that has been implemented appears to be having a positive academic effect on some students though not all. What is most significant is the potential difference year round education may make in whether students pass or fail state-mandated tests. If an elementary-school student fails Virginia's SOL tests, he or she may be required to repeat the same grade. Beginning in 2004, if a high school student fails any of the six mandated SOL tests, he or she will not graduate.[18]

When considering the strong consequences for failing Virginia's SOL tests, the test score means for year round and traditional calendar students deserve even more attention. On the SOL tests, a scaled score of 400 or better is passing, but scaled scores below 400 are failing. Given this fact, it is important to notice that when all third-graders were grouped together, the year round students' mean for mathematics was 431.74 (passing), but the traditional calendar students' mean for mathematics was 395.93 (failing). Likewise, the SOL history/social science means for all third-graders indicated the same situation. The SOL history/social science mean for all year round third-graders was 428.11 (passing), but the mean for all traditional calendar third-graders

was 397.53 (failing). Again, the same situation occurred with year round students who had attended the year round program since its inception and traditional calendar students who had never attended the program. The history/social science mean for students who had attended the year round program since its inception was 443.21 (passing), but the history/social science mean for students who had never attended the year round program was 396.45 (failing). Although means do not necessarily give an accurate picture of individual performance, and it is inappropriate to state that year round education students, on average, passed more of the SOL tests, these mean differences shouldn't be ignored and should be further investigated. If it is determined that year round education does, in fact, encourage more students to pass required achievement tests, then Woodridge Elementary may want to consider keeping, and perhaps expanding, its year round program.

This research will add to the current knowledge base on year round education, including the comparisons of year round and traditional calendar students within the same school and its comparisons of various sub-populations. In some ways the outcomes of this research were consistent with previous findings from other studies. For instance, Alcorn,[19] Consolie,[20] Curry, Washington, and Zyskowski,[21] Gandara and Fish,[22] Haenn,[23] Prohm and Baenen,[24] and Shield and Oberg[25] all found positive gains for year round students in mathematics. History has not been tested nearly as often as reading and mathematics, but Shield and Oberg also found higher history test scores for year round students. [26] Conversely, reading seems to be one of the most often cited areas of increased means for year round students.[27] Although two of the English reading and writing SOL test comparisons favoring year round students in this study came close to being significant at the $p \leq .05$ level, English was not the most often found area showing significant mean differences.

Given this study's unique design of comparing various traditional calendar and year round populations within the same school, it should add to the current body of knowledge on year round education.

Endnotes

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How Can We Attract and Retain Quality School Principals: What Do Principals Say?

M. Scott Norton

Introduction

Attracting quality personnel for leadership roles as school principals and then retaining their services have become national concerns. Studies reveal that turnover in the principalship at both elementary and secondary schools reached the 50% level during the 1990s, with predictions that such losses are likely to increase during the current decade. In addition, Pounder and Merrill reported that of 170 high school assistant principals and middle school principals, only 30% had career goals as high school principals.[1] In a related study by Norton, only 30% of the 225 school principals surveyed in metropolitan Phoenix, Arizona had plans to remain in the position while 30% were looking to leaving the principalship, and another 30% planned to retire early. Another 10% hoped to leave the principalship for another position outside the field of education.[2]

Losses of quality personnel in leadership roles have become increasingly costly from two perspectives: The cost monetarily and the loss of intellectual capital. The replacement of school principals is costing taxpayers millions of dollars each year, money that would be welcomed in other needy areas of the school budget. The cost of replacing middle management administrators has been minimally estimated to be $25,000.[3] A school district with 20 principals and a 50% turnover rate is facing a replacement cost of at least $250,000 over a ten-year period based on today's dollars. Yet, the loss of intellectual capital, due to principal turnover, is even more costly to school quality in the long run. No organization can expect to lose its quality leadership and remain effective, and schools are no exception. Thus, it is imperative not only to attract qualified principals but also to retain them.

The Study

A study of elementary, middle, and secondary school principals was undertaken for the primary purposes of gaining their insights regarding certain conditions within the principalship in schools today and soliciting their recommendations relative to attracting quality persons to the position of principal and retaining their services. Thus, the first section of the study questionnaire posed specific questions relating to: (1) The stress levels being experienced by the practicing principals; (2) Prominent areas and levels of job satisfaction; (3) Conditions that might lead to their job resignation; (4) Those conditions or provisions of most importance in keeping them on the job; (5) The importance of salary in retaining their services; (6) The most difficult problems facing them in their roles of principal; and (7) The principals'

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perspectives concerning their immediate plans and their views concerning the principalship as a career pursuit. The second section of the study instrument centered on the perceptions of the school principals relative to recommendations for keeping quality school principals on the job.

Study questions were based on a review of the literature and a previous research study that centered on the general topic of principal retention.[4] The content validity of the study instrument was assessed by 15 persons representing practicing school principals who were serving as elected officers of the state's administration organizations and professors of educational administration in higher education. Questionnaires were sent to a sample population of 110 Arizona principals consisting of 40 high school, 30 middle school, and 50 elementary school administrators, with an 80.0% return rate. Purposeful sampling techniques were used in order to include administrators in all geographical areas of the state and ones representative of urban, suburban, and rural school settings. The study population administered schools ranging in size from 500 to 1,150 students in the elementary grades, 112 to 1,350 students in the middle school grades, and 600 to 2,700 students at the high school level. Assistant principals served in about 60.0% of the elementary schools and 83.0% of the middle schools. All of the high schools, with one exception, had at least one assistant principal in a supportive role.

Fifty-one percent of the study population was female while 49.0% was male. The median age of the group was 48.6 years. Two-thirds of the elementary school principals had no previous experience as a principal or assistant principal before assuming their current role. On the other hand, all of the participating middle school administrators had prior experience as an assistant principal, and 55.0% of the high school principals had served as a principal in another school setting before serving in their current position. Principals at the K-6 level averaged 6.56 years in a principalship role; median years of experience for this group was 7.2 years. Middle school principals averaged 5.86 years in principalship positions; the median was 4.5 years. High school principals in the study had a mean of 6.2 years in the position, with a median of 5.5 years of experience.

Principals' Thoughts About Their Work Environment

The participants were asked to respond to several questions concerning job stress and job satisfaction. Elementary school principals reported the highest stress levels in the role; two-thirds of the K-6 school administrators indicated stress and pressure in the position as "high" or "very high." Middle school principals reported the second highest levels of job stress and pressure; the lowest stress and pressure levels were reported by participating high school principals. Only 38.1% of this group judged their stress as "high" or "very high" compared to 64.7% of elementary school administrators who responded similarly. In spite of the relatively high levels of stress and pressure being experienced by the participants, more than 80.0% of them viewed their job satisfaction as "above average" or better. When asked to name the most prominent sources of satisfaction for them in their work, the study participants listed such things as seeing specific improvements in student achievement, establishing professional growth activities for teaching personnel, working with teachers in such tasks as goal setting and program evaluation, implementing new programs for the school curriculum, and working with parents and other members of the school community.

What were the most bothersome conditions being experienced by the principals in the study group? More specifically, what conditions most likely would cause them to step down from the role? As indicated by Table 1, the number one condition that might lead to job resignation was the lack of administrative and/or board support. This condition was ranked first by both the middle and high school principals; elementary school principals ranked such support as number two with the lack of respect their number one listing.

Table 1
Conditions That Might Lead to Job Resignation
With Group Rankings

Condition	K-6	7-8	9-12	Rank*
Lack of Adm/Bd Support	2	1	1	1
Lack of Worklife Balance	3	7-8	3	2
Changing Job Demands	5	3	5-7	3-5
Time Commitments of Job	7	5	2	3-5
Lack of Respect	1	2	11	3-5
External Interference	4	10	4	6
Lack of Staff Support	9	7-8	5-7	7
Salary Level Inadequate	6	4	10	8-9
Overall Stress & Burdens	8	6	5-7	8-9
Lack of Parent Support	10	9	8	10
Negative Media & Students	11	11	9	11

*Note: Final rankings were determined by averaging the individual rankings for each grade level.

Other top rated listings in the category of "might cause me to leave the position" were the lack of a work and life balance; changing demands of the job, including workload; and time commitments required by the position. Somewhat surprising was the participants' listing of conditions, such as the negativity of the media and of students toward the school, the overall stress and burdens of the job, and lack of parental and community support, that were not highly rated as ones that might cause these administrators to leave the principalship. More than half of the elementary school principals and nearly half of the high school principals said that they had given serious thought to stepping down from the job. Middle school principals were less negative in this regard; two-thirds of this group indicated that little or no thought had ever been given to the idea of leaving the position of principal. As a group, high school principals were more positive about seeking a career in the principalship if they had it to do all over again; of this group, 61.9% so indicated. This response was considerably above that of the elementary and middle school participants who gave 41.2% and 46.4% responses respectively to the question: "If you had it to do over again, would you definitely seek a career in the principalship?"

The Importance of Salary in Retaining School Principals
Personnel studies in business and industry, and in the area of teaching personnel, consistently have found that salary is of less importance than working conditions in producing positive job satisfaction (e.g., the relationship with one's immediate supervisor).[5] Yet, the level of compensation has been found to be a significant factor in the recruitment of persons for the principalship and for principal retention.[6] The responses of the participants in this study also supported these contentions. As a total group, for example, study participants viewed salary as "very high" in importance in 25.0% of the cases; another 40.0% answered "high" in importance. Very few principals viewed salary as "not high" or as "low" in importance relative to the retention of their services. However, a much higher response was given to the importance of a "balanced work/family life." The mean statistic for the three groups of principals was 50.2%; that is, slightly more than half of the participants viewed worklife balance "very high" among the scale of factors that served to retain their services. Thus worklife, overall, was viewed as more important than salary as a factor for keeping school principals on the job. Overall, 90.9% of the principals in the study viewed worklife balance as "high" or "very high" in importance for retaining their services. The responses of "moderately high," "not high" or "low in importance" were limited.

Thoughts About Immediate Plans and Career Aspirations
Seven possible responses were provided to the participants relative to their immediate plans and career aspirations. Elementary principals in 43.6% of the cases, "planned to remain as a school principal until retirement age." The number one response of middle school principals was similar: "I plan to remain as school principal in my current principalship or seek a principalship at another level in a different school." High school principals gave a 28.5% response to each of three different entries: "I hope to seek a higher administrative position in education at the K-12 level"; "I plan to remain as school principal until retirement age"; and "I plan to seek early retirement." Although one-fourth of the middle school principals had plans to seek a higher administrative position in education at the K-12 school level and nearly one-fourth of the elementary principals planned to remain at their present school or seek a principalship at another level or different school, other options, such as seeking a position at the university level, seeking a position outside the educational profession, or seeking early retirement, with the one exception noted previously, gained only a limited response by participants. Data provided no evidence that the principals were anxiously looking to leave the role.

The Most Frustrating and/or Problematic Condition for the School Principal
An open-ended question was posed for the principals' consideration asking them to consider the one most frustrating problem that they encountered in their leadership role. Responses were numerous, and they varied widely among the participants. For example, elementary school principals recorded more than 50 entries ranging from matters of salaries to the lack of administrative support to the problems of politics in the profession. No identifiable dominant problems were recorded by K-12 school principals although the matters of accountability and related testing requirements and lack of administrative support received the highest number of notations.

Responses of middle school principals were similar in that no consensus on problem areas was identified, and the many entries varied widely. Among the listings for the number one frustration were such entries as workload, parent apathy, lack of funding, changing demands placed upon the role, the problems of the bureaucracy, and time requirements of the position. High school principals listed similar

frustrations. Workload, lack of time to do the job, lack of resources, and personnel problems encountered time and time again were those frustrations named most often by grade 9-12 principals.

In a related question, the principals were asked to identify the five most difficult problems that they faced as principal. Twenty-one selected problems were listed for the participants' consideration. Table 2 reports the ten most difficult problems as perceived by the respondents. The problem of "lack of respect for administrators" received a high response on the part of each of the three principal groups. Dealing with external mandates and regulations was a special problem for the middle school respondents. Of the 21 difficult problems listed for consideration, the problems of the negativity of the media, lack of parental/community support, and teacher absenteeism were among those problems that received relatively low responses by participants.

Table 2

Most Difficult Problems Facing Principals

Difficult Problems	K-6	7-8	9-12	Mean %
Lack of Respect for School Administrators Generally	58.8%	50.0%	50.0%	52.7%
Dealing With External Mandates & Regulations	23.5%	66.7%	20.0%	36.7%
Time to Do the Job	23.5%	41.7%	40.0%	35.1%
Balancing Work/Home Life	47.1%	25.0%	30.0%	34.0%
Dealing With Paperwork	35.3%	25.0%	30.0%	30.1%
Impact of Societal Problems	17.6%	50.0%	20.0%	29.2%
Teacher Personnel Problems	17.6%	25.0%	40.0%	27.5%
Parent Problems	35.3%	33.3%	10.0%	26.2%
Testing Mandates	23.5%	16.7%	20.0%	20.1%
Hiring Quality Teachers	11.8%	33.3%	30.0%	25.0%

Which Five Conditions or Provisions Rank Highest for Retaining the Services of School Principals?

Table 3 reveals the responses of each principal group regarding the most important provisions for keeping them on the job. Without question, the number one condition or provision for retaining the services of the principals was "being able to make a difference." This entry was ranked first among all others by each of the three principal groups in the study. The conditions of "challenges and opportunities in the role of leadership" and "relationships with students" tied for second and third respectively for the most important considerations for retaining their services. The fourth most important provision was "personal satisfaction that the role of principal provides," and "compensation for the position" ranked fifth among the group of participants. Study results were quite similar among the groups relative to both the most important conditions for retaining principals' services and those considered to be of lesser importance. As previously noted, "being able to make a difference" was ranked number one by each of the three groups. Among the entries at the lower end of the scale regarding provisions that would serve to retain principals' services were "recognition received for doing this work," and "prestige of the position of principal."

Table 3

Provisions That Would Serve to Retain the Services of Principals

Provisions	K-6	7-8	9-12	Rank*
Able to Make a Difference	1	1	1	1
Challenges/Opportunities	4	2	3	2-3
Relation With Students	3	4	2	2-3
Satisfaction Role Provides	2	3	5	4
Compensation for Position	7-8	5	6	5
Professional Relationships	5	6	7	6-7
Responsibilities & Growth	6	7-9	4	6-7
Importance for Career Goal	9	7-9	8	8-9
Work I Am Prepared To Do	7-8	7-9	9-10	8-9
Prestige of the Position	10	7-9	11	10
Recognition Received	11	10	9-10	11

*Note: Final rankings were determined by averaging the individual rankings of each grade level.

Do Principals Really Enjoy Their Work?

If consideration was given only to the participants' responses relative to job enjoyment, it would have to be concluded that principal retention is of little or no problem. As a group, 87.8% of the school principals reported that they enjoyed the work "just about all of the time" or "to a moderate degree." The majority of each of the three principal groups, elementary, middle, and secondary, gave the response of "most all of the time" as the level of job enjoyment at 69.3%, 64.2%, and 57.1%, respectively. Only a very few principals answered the question of job enjoyment as "seldom" or "almost never."

Principals' Recommendations for Changing the Position

An effort was made to gain the ideas of study participants regarding needed changes in the role of principal and their suggestions for decreasing those things that tend to inhibit the entry of talented individuals into the principalship. Eleven conditions were set forth that potentially could serve to inhibit principal recruitment. Participants were asked to identify each of the entries which, in their opinion, was significant in posing problems for principal recruitment. As a group, the factors of "overall demands of the job," and "not having sufficient time to meet the demands of the position" led the list of leading recruitment inhibitors. High school principals overwhelmingly viewed the matter of insufficient time as the number one recruitment inhibitor and ranked the matter of "overall demands of the job and resulting workload" as a close second inhibiting factor. The factor, overall demands/workload, was considered as either the first or second leading inhibitor by each of the three principal groups.

Other conditions that rated high on the list of factors that inhibit the attractiveness of the principalship for potential leaders were inadequate salaries, conditions facing principals in schools today (e.g., student violence and related discipline problems), worklife and family life balance problems, and personnel problems with teachers and other staff personnel. Factors that do not serve as inhibitors in attracting quality persons to the work of school principal, in the minds of the

study population, were such considerations as "poor programs of preparation for the demands of the principalship" and "assistant principal experiences do not provide necessary preparation to assume the role of principal."

What Are Principals' Recommendations for Keeping Quality Principals on the Job?

What changes and/or provisions most likely would keep quality principals on the job? Ten specific recommendations were set forth for the participants to consider in regard to principal retention and an open-ended opportunity to add to the list was provided. Table 4 reveals the principals' ideas in this regard. As the data show, "increasing principal salaries substantially" and "providing the resources necessary for needed administrative support at the school level such as assistants, legal services, and other support personnel" were the two leading recommendations for retaining quality school leaders. Middle school principals viewed the increasing of salaries as the number one recommendation for principal retention. Elementary school principals were of the opinion that providing necessary support resources was the number one need, and high school principals believed that a re-examination of the role of principal in order to find creative ways to decrease the demands of the position was the top priority for decreasing turnover.

Table 4

**Recommendations for Keeping Quality
School Principals in the Role**

Recommendation	K-6	7-8	9-12	Rank*
Increase Salaries	2	1	2-3	1-2
Provide Needed Resources	1	2	2-3	1-2
Re-examine Principal's Role	3	5	1	3
Provide Public Support	4	3	5-9	4
Add Benefits/Incentives	8-10	4	4	5
Gather Principal Feedback	6	6-7	5-9	6
More Attractive Retirement	5	9	5-9	7
Educate Public of Demands	7	8	5-9	9
Provide Mentoring Services	8-10	6-7	5-9	9
Outsource Certain Work	8-10	10	10	10

*Note: Final rankings were determined by averaging the individual rankings of each grade level.

Recommendations, such as outsourcing certain work, for example, some of the business administration responsibilities of principals, gained little favor. This fact was somewhat puzzling in view of the participants' high rankings of other work related entries (e.g., re-examine the role of principal to find creative ways to decrease the demands on the position, provide the resources necessary for needed administrative support, etc.).

An open-ended comment section was included for the purpose of gaining related input into the matter of principal retention. Several selected comments in this regard are included below:

There is a perception that 90% of the principal's time is devoted to negative problems and troublesome issues. This serves as a major deterrent to those considering work as a principal.

The next 20 years will be challenging for principals. I'm not sure the training will be able to match the actual demands of the job.

Teachers tell me that they don't want to give that much time for that little money.

Discipline is part of the job, but violence and lack of non-motivated, potential dropout students, and other such problems take away from the more enjoyable work of a school principal today.

If you want a job that's challenging and incredibly complex, be a high school principal. It is clear that not everyone views these challenges as part of the good life.

Summary

Two primary purposes guided the collection of data for the study reported herein: (1) To gain principals' insights into the status of certain conditions within the school principalship today; and (2) To solicit principals' recommendations for attracting quality persons to the principalship and retaining their services. It can be safely concluded that the large majority of principals in this study experienced high levels of job satisfaction and enjoyment in their work, although the levels of job stress and pressure were high as well. For the most part, there was no evidence in the study findings that would support a belief that principals were seeking ways to exit the position or that they were anxiously looking forward to early retirement. Identifiable frustrations within the role of principal certainly did exist, however, and school principals, like individuals in other professional roles, had given thought to leaving the position.

Study results provided several recommendations by principals concerning changes and/or provisions that could lead to increased interest on the part of talented personnel to pursue the career of principal. The principals also stated their thoughts about conditions that might be changed and provisions that needed to be implemented or improved to assure their retention in a principal's role. The study participants were given an opportunity to state their best ideas regarding what might be done to attract and retain others in the leadership role of a school principal. Although the following recommendations are not offered as "the solutions" to the complex problems surrounding principal turnover, they do provide guidelines, places to start, in implementing positive steps for keeping our quality school principals on the job.

1. *It is recommended that the position of school principal be re-examined and redefined for the purposes of providing information and insights concerning needed changes and support in the role.* Study participants cited the importance of administrative and school board support consistently in their answers to various questions posed. This condition was listed number one among the many factors that would cause them to step down from the principalship position. It seems of paramount importance that steps be taken to gain an understanding of what school principals include in their definitions of administrative and board support. For example, studies related to teachers' job satisfaction have viewed administrative support in terms of the principal's interest and involvement in matters of instruction and the curriculum, rather than the traditional thinking that the principal must be there to support and protect the teacher in problems with disgruntled parents.

Certainly, administrative and board support would include listening to the recommendations of the principal and giving fair and full consideration to their needs and suggestions. It also includes the spirit of team management in the best sense of the concept.

2. *It is recommended that needed attention be given to informing the several stakeholders of local schools of the demands being made upon local school leaders and the importance of demonstrating this fact through recognition and respect for the work of this office.* School principals are especially sensitive to disrespect of the schools and school personnel since they are at the cutting edge of everyday school activities; they are the ones that, more than any other persons, face the media and the school's stakeholders on a daily basis. Principals must deal with the problems and dissatisfactions of students, teachers, support staff, central administrators, the superintendent, the board, parents, community members, and the media as part of their daily routine. Much more needs to be done to inform both the media and other stakeholders about the comprehensive responsibilities and demands made upon the principal's office. Teachers, and others who are given opportunities to learn about the realities of the principal's work, most often gain a new respect for both the person in the principal's office and the accomplishments that all too often are taken for granted. There is evidence that the community desires to hear much more often from the local school principal rather than from the school superintendent and/or members of the school board. Such communication opportunities should be programmed; principals are in the best position to inform others about the problems, needs and accomplishments of the local school.

3. *It is recommended that the importance of a balanced worklife for school principals be recognized in the determination of job responsibilities and work assignments.* Workers in America are insisting on opportunities to place personal and family responsibilities toward the top of their priorities. No longer is the "live to work" attitude dominant in American culture, rather "work to live" has become the motivational edict. Unless the system is able to make the school a place where people want to work, one that allows them to tend to other life responsibilities as well, they will look for such positions elsewhere. School principals, in the study reported here, viewed worklife balance above salary considerations in importance for retaining their services. Education has not done well in this regard; it is clear that the role of principal needs to be re-examined with the purpose of altering the time and load demands presently placed on the position. Such considerations as sabbatical leaves for school principals and a more effective allocation of people resources are needed. Principals speak frequently about the increasing demands of the job. The need seems clear: Either find better solutions for the growing workload of school principals or expect to lose the battle for principal retention.

4. *It is recommended that the salary levels of school principals be re-examined for the purposes of compensating persons in these positions commensurately with the demands of the role.* Kennedy listed the changing demands of the position, discussed briefly in number three above, as one of the leading causes of principal turnover.[7] A second cause of principal turnover noted by Kennedy was salary. This contention was supported unconditionally by the results of this study. For example, the principals in this study ranked the importance of the compensation level as being of "high" or "very high" importance in retaining their services. History does not provide a high confidence level for increasing school administrators' salaries substantially, now or at anytime in the near future. Many groups and individuals, including

teaching personnel, have expressed the opinion that administrative salaries already are out of proportion to the low pay of teaching personnel. Yet, when principals' salaries are compared to mid-management compensation levels in other fields, the myth of overly paid school administrators becomes quite clear. The dilemma is quite clear as well: The compensation offered to potential principal candidates is too small to encourage their entering the principalship as a career and to retain the services of quality leaders. It appears that other "compensation" provisions, such as sabbatical leaves, peer-assisted leadership programs, mentoring and coaching relationships, personal and professional growth activities, and other psychic income provisions will have to suffice as provisions for self-renewal and motivational strategies or local school leaders.

5. *It is recommended that the job description of the school principal be designed so as to be certain that priorities are established that assure the opportunities for this leader to make a difference.* School principals place the opportunity to initiate programs that provide better learning experiences for students and improved personalized growth activities for support and professional staff personnel realize their potentials, to make a difference, among the most satisfying outcomes of the principal's work. The opportunity to contribute to such important differences was considered by participating principals in this study as the absolute number one factor for retaining their services as principal. Yet, other concerns of school principals identified in this study are beginning to erode the realization of this opportunity. The lack of administrative and board support, lack of respect for the work of the principal, inadequate compensation levels that tend to discourage talented persons to choose the principalship as a professional career, and external interventions that are disruptive to goal achievement were among those conditions that were cited by principals as ones that distract from the positive efforts of school leaders and, if not corrected, will ultimately reduce the efforts of the principal to a level of mediocrity.

Although the foregoing recommendations do not represent panaceas for resolving the complex problems of administrative turnover, they do focus on positive actions of paramount importance. Solutions to the problems facing the nation in the area of quality administrative leadership necessarily become the primary responsibilities of state educational agencies, the general citizenry, and district administrative leaders, including the local school board. Without collaborative efforts on the part of these groups and individuals, the problems of high administrative turnover are likely to continue.[8]

Endnotes

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Critical Literacies and Feminist Ethics: Mapping a Pedagogical Reform in the Preparation of Educators

Audrey M. Dentith and Jeanne F. Brady

Introduction

Those of us in university programs of education face the daunting task of preparing new and practicing teachers and school leaders with the necessary knowledge, competencies and attitudes to teach with success in the face of ever increasingly complex schooling environments. Escalating poverty among children, school violence, and language and cultural barriers between students and teachers are just some of the many issues that complicate our intentional pedagogies. More recently, a relentless push toward standardization and top-down initiatives for teacher accountability for student achievement levels has added more tension to our work as these often intimidate teacher thought, creativity, and autonomy. As we are increasingly held to imposed standards and other policy mandates, teachers and school leaders must make sense of these impositions as they discriminate among immense knowledge bases within their discipline and balance hoards of suggestions and innovations for programmatic and student needs.

In this article, we define multiple literacies in teacher education as those particular skills/dispositions/abilities that might form a solid and judicious foundation in the education preparation for teaching and instructional leadership. Multiple literacies, as we define them, assist us in the struggle to locate and define essential knowledge and discern among multiple meanings in the creation of learning experiences for others. Secondly, we name and explain a feminist ethics, located within a critical pedagogy, as the foundation of a philosophical effort to teach for social justice. Such politics inform our philosophies and gives us purpose and ethical direction within teacher education. Feminist ethics defines justice and supports social change when infused with principles of pedagogy in teacher education. Finally, we highlight examples that illuminate the integration of this work as we have located evidence of such in new practices within science education.

Such work is best situated within a framework of moral engagement since nothing done or said, we believe, is culturally neutral or innocent. Ethical concerns become tantamount to content knowledge and

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other skills within the discipline of education, since these constitute the pivotal influences that affect all of our conceptions of teaching and learning.[1]

Current Teacher Education Reform

The debate explored here has roots in current trends of reform and innovation within the field of teacher education. One visible trend rests on the notion that more content specific subject knowledge and increased formal knowledge of content and pedagogy will result in better-prepared and more effective teachers. Mandatory content-specific pre-licensure praxis for teachers and undergraduate liberal arts courses of study exemplify these efforts. Other efforts appropriate an increased emphasis on reflective practice and earlier and more frequent field experiences as a means to generate better teacher judgment and increased abilities to teacher in diverse settings. Exposure to multiple sites and consistent reflection through personal narrative, it is believed, might better prepare teachers for the complex classrooms they will most likely encounter. A third movement, less understood but gaining in attention, is one that asserts the need to situate the problem of knowledge, itself. Teachers and other educational leaders are encouraged to examine and regard knowledge as social construction and to incorporate this understanding with notions of power relations, personal assumption and inquiries into prevailing social and cultural beliefs.[2]

This last effort sustains this discussion. At a fundamental level, we work toward ways that challenge the essence and origin of knowledge as neutral, static and rational. In the process of such inquiry, we pursue ethical and just practice that ultimately situates teachers and school leaders as social critics, ethical intellectuals, and agents of social change. Secondly, an exploration of the overlaps and interconnectedness that characterize our world links sound teaching practices to an in-depth understanding of complex social, cultural, political, technical, and economic realities and their relatedness to teaching and learning practices. All of this occurs within the development of teachers and school administrators who are able to comprehend the effects of persistent injustices in education and, subsequently, develop agendas that highlight reform within a social and cultural realm. Such social reform as a programmatic goal of teacher education can lead to an exploration of the meaning of teaching for social justice, a goal acknowledged by many as an integral part of school reform and the development of worthwhile schools.[3]

Multiple Literacies in Teacher Education

To meet these laudable goals, we use theoretical tenets of what we term "multiple literacies" as the skills and competencies teachers and school leaders must develop in order to begin to understand education located within and as part of particular social and cultural practices and relations of power. Multiple literacies are concerned with a certain reshaping of teaching practices into actions and interactions that recognize and analyze the social and cultural contexts of education and work to uncover unjust relations.

At the present, as reforms in education coincide with a certain rise in the concern for and definition of all types of literacy, our use of the terminology mirrors our deep regard for the thoughtful and expansive work that is being done in the field of literacy.[4] This expanded notion of literacy within teacher education includes an understanding of cultural and critical literacies in the intellectual development of teachers. Cultural literacy includes an awareness of the social attributes of race, class, gender, nationality, and ethnicity. It is comprised of

practices and representations that are arranged and prescribed to create meanings that are often tacit. These depictions become signifiers constructed through media, popular culture, and many community practices of particular identities. Through language, images, and written and visual representations, we come to understand others and ourselves in particular ways and as particular beings. It is the exposure to and articulation of the taken-for-granted meanings that can "help us locate ourselves and others in the economic, social, and political relations of our times."[5] Cultural literacies help us to make meaning from our interactions and experiences within the world in new ways because it illuminates the particular maps that determine how people view themselves and how they are situated in relationship to others with different social identities and ideas.[6]

Understanding cultural symbols and related practices and the ways that such things might position one in different ways paves the way for the acquisition of critical literacy. Critical literacy in teacher education is the fundamental ability of educators to see, understand, and name the ways in which knowledge and learning are shaped and allocated within systems of authority, power and discourse in society.[7] It offers the means to analyze the ways that institutions and particular practices acts as regulating bodies for knowledge, resources, and actions.[8] This requires a rethinking of knowledge outside of the canon, primarily since such investigation opens up the learner to far-reaching and often surprising information that can help reveal the nature of power relations in a particular cultural or social context.

The Development of Multiple Literacies Among Educators

The journey toward the acquisition of multiple literacies must begin and continuously involve various opportunities that encourage the examination of and naming of one's own beliefs and values and the speculation of these in relation to one's practice.[9] As just one example, teacher educators must first begin to actively confront their own subtle racist attitudes and intentions that sanction dominant (White, middle-classed) views and behaviors.[10] Of course, this practice is rare among many of us who have had little opportunity or encouragement to engage in such practice as part of our own teacher preparation experiences and practice.[11] However, the need for such self-reflection forms a prerequisite for ultimately becoming a teacher for social justice.

In our own practice with pre-service and in-service teachers and administrators, we begin with the development of culturally literate practices using a variety of exercises and encounters in social settings both in and out of the university classroom. For example, an analysis of children's literature and film to determine the roles that characters assume in terms of race, religion, gender, ethnicity, and socioeconomic status and the implications of stereotypical depictions is explored in depth.[12] Pre-service and in-service teachers are asked to write autobiographies in relationship to their university course work in which they must name themselves in the various roles they acted out as school students, teachers, and others and compare these to the social roles they assume in various aspects of their lives.

To understand the cultural, political, social, and economic realms that surround us as educators, we ask our students to describe the neighborhoods that surround the schools of their pre-service field placement to include descriptions of housing, public services, retail stores, and government facilities as well as the people visible in and around the school. Invariably, most students make particular assumptions about the children who attend these schools as a result of their

observations. These often include revealing statements of the tacit, but usually unspoken, assumptions within dominant ideologies of poverty, race, and gender. These observations serve an important function because they are able to expose dominant ideologies in relationship to personal beliefs and substructures that are capable of greatly impacting the emerging practices of teachers. They are also helpful in bringing about awareness that we inherit specific beliefs from within the social and historical situations that surround us and that these beliefs must be understood as realities that shape our lives and the lives of others. This can have a dramatic impact on the success of teaching. Without such an analysis, educators are unable to conceptualize connections between the larger multicultural society in which we live, the innumerable implications of student identities within particular social categories of gender, race, class, etc., and their relationship to unequal educational perceptions and practices. This fundamental concept forms the underlying tenet of critical pedagogy.[13] The exercises described here are helpful antecedents, then, in the development of critical literacy. Critical literacy and its unfolding sensibility among educators consider these cultural revelations and offer the apparatuses for the disclosure of alternate discourses. It provides a deeper language of analyses that works to uncover the ways that power, ideology, and culture operate to disempower some and privilege other groups of people.

Critical literacy is a theoretical discourse in which the relationship between theory and practice is understood as complex and multifaceted. It is not dissolved into a dichotomy but provides the language and forms of critique that joins theory and practice. Freire named this as praxis because it regards the relationship between theory and critique with action for transformation and justice.[14] As such, a situation is not changed through awareness alone; instead, the interplay among action, reflection, and related new action becomes theory and practice within pedagogy for social change.

Critical literacy as a discourse provides an analysis of multiple cultural forms in their social context through an observation of and naming of the differences and contradictions within society. More than this, critical literacies view and work to understand how cultural practices are formed historically within society and how these exert specific influences through representations and practices that have become internalized and must be challenged in order to be transformed.[15]

Beyond this, a critical literacy provides multiple languages and spaces that allow communication across lines of difference in order that ideas are challenged and disputed. Critical literacies become tools for action that result from the incitement of new understandings that translate into discursive practices. We decide whether to accept, refuse, challenge, or reinvent the routines, habits and expectations practiced in schools and communities. Expression precedes action and is reinvented in dynamic and continuous interplay.

In our work with pre- and in-service teachers, school administrators, and others, we juxtapose these theoretical tenets with practice in ways that help students solidify meanings and interpretations. Our students have been required to work collaboratively to create educational experiences for others with a variety of social agencies including homeless shelters, after-school programs, charter schools, Head Start classrooms, and alternative schools. Educational administrators are required to initiate and develop curriculum projects that promote new understandings of cultural, social and political learning into their schools. This juxtaposition provides educators with real-life opportunities to put their new theoretical knowledge into practice.

Importantly, critical literacy should also be understood within a discourse of ethics that is able to provide structure for understanding how equity and justice contribute to our work. Of course, to expect that all educators embrace multiple literacies is a noble goal, more simply understood and agreed upon here than in the actual practice in the university and the public school classroom. Contemporary school programs are structured in ways that do not easily allow space for creativity and lofty ideals. In order to move forward, we must establish an ethical foundation as a centerpiece for the construction of this new knowledge. We use a feminist ethics because we believe it provides the means for dialogue and praxis in the preparation of teachers as committed agents for social change and justice.

Feminist Ethics in the Discourse of Teacher Education

A feminist ethics is not a traditional form of ethics, based on relativism or essentialism. It does not profess a set of rules that can be played out in binarisms that clearly determine right from wrong. Within a critical theoretical basis, feminist ethics does not either rely exclusively on the ethics of care or any other liberal notion. Such ethics are multi-layered. A critical feminist ethics is infused with commitment to caring, but it is also steeped within principles of justice. Embedded in a language that integrates care and justice, feminist ethics provides a democratic vision that takes up the struggle against inequality in both the public and private domains and opens up a discourse for expanding human rights. In this sense, a caring person is someone who is "simultaneously concerned about the other's welfare and perceives acutely and insightfully how it is with the other,"[16] is deeply humane, and who experiences tears and outrage. In this sense, a critical feminist ethics focuses on economic and social structures and is taken up in personal experiences, and in a larger social arena, with concrete specificity. In this sense, a critical feminist ethics as we have seen in the women's labor movement presents endless challenges to the imagination and the possibility for ethical action.

Within a feminist ethics, the effort to uncover a deep awareness of difference is needed so as to understand the specific manifestations and complex nature of power and domination. Feminist ethics provide a vision of democracy that struggles against inequality in the public and private domain in an expansion of basic human rights. Cultural inquiries become the focus for analyzing political, economic, and psychological realms.[17]

General principles of feminist ethics as a basis within the larger discipline of social ethics identify key principles as a theoretical base to guide the advancement of critical literacy among teachers. Primarily, a commitment to social justice along with an unwavering commitment to racial and economic justice is fundamental. A feminist ethics seeks the liberation of oppressed groups and weighs the value of acts of policy in those terms.[18] Teacher education programs situated within a feminist ethics differentiate between charity and commitment to social justice in ways that ultimately seek to "level" the playing fields that privilege some and discount others within the realm of education.

Much has been written in the past decade on feminist ethics.[19] Yet, very little of this work has explored educational pedagogy and classroom practice.[20] We chose Carol Robb's nine general principles of a feminist ethical reflection to establish a general basis of the discipline of social ethics that allows for the new and diverse voices to challenge traditional practices in education.[21] The first principle component of a feminist ethics is to reflect upon concrete situations. This requires us to identity the specificity of the issue at hand. Second, relevant data about the historical situation must be taken into account. In this sense, no moment is viewed as separate or outside of the historical, political, economic, and social realm. Third, the location of the roots of oppression informs all aspects of ethical reflection, which names others and ourselves as possible actors within oppression. Fourth, with some exceptions, feminist ethics are loyal to all of humanity and require us to develop deep empathy for and about the human condition, connecting with the anxieties and frustrations of others. Fifth, a commitment to social justice shared with others, with a commitment to racial and economic justice as fundamental. Sixth, a feminist ethics is oriented toward the liberation of oppressed groups and weighs the value of acts of policy in those terms. Seventh, lived experience is the source of ethical claims that always ask whose experiences, under what conditions, and for whose benefit. Eighth, the moral agent requires both autonomy and the understanding of powerful forces that limit it and which address personal and institutional disclosure simultaneously. Finally, understanding that the components of feminist ethics are a broadened form of social ethics provides us with the promise for a deeper understanding of how the private and public domains intersect. It is hoped that these principles will provide the latitude for each of us to act as unique individuals in and throughout participatory communities and collectives that give honorable importance to an open, undefined and possibly better future.

Critical Literacies in a Feminist Ethic in Science Education

The analysis of Osborne and Burton of the Project 2061 science reform proposal or Science for All, generated by the American Association for the Advancement of Science, offers a worthy example of the role of feminist ethics and multiple literacies.[22] Science for All reform advocates for accessibility of science rules, practices, content, and structures to all citizens with the intent of producing a new, scientifically literate citizenry through education in the United States. The reform proposal uses common language consistent with the ideals of a democracy in which children and others are given the unalienable right to learn science concepts and be held accountable for this privilege. However, this assertion, as Osborne and Barton note, is problematic since it assumes that schools are meritocracies able to provide equitable opportunities regardless of race, class, or gender.[23] It also infers a homogeneous, White, middle-class, male value structure that is regarded to be superior in comparison to other knowledge bases.[24]

Long regarded as a field of exactness and objectivity, science education seems an unlikely fit for an emerging feminist ethical practice and the development of multiple literacies that might question the stability and objectivity of discipline-specific knowledge. Yet, it is science educators who are now making this revolutionary leap in their field. As Haraway has stated: "The political project, the freedom project, the democracy project in science and technology is about the engagement of people whose ways of life are at stake in the apparatus of the production of knowledge and systems of action."[25]

The subsequent work of Osborne and Barton with homeless children in New York City further clarifies. As scripted in their action research project, they observed one student who had been in three different schools for the first four months of the school year as a result of her families' homelessness. The teacher in the science classroom used a variety of hands-on activities and generally was supportive and sympathetic to the girl's needs. Materials for science were adequate and appropriate. Opportunities to learn and understand science concepts

were readily apparent. The teacher and the school worked hard, it seemed, to provide equitable resources for this young girl to excel in science. Yet, the young child failed the science unit in which she participated when observed by the researchers. She was often "pulled out" of science class to do remedial time in writing, reading or math because of her label as "learning disabled". She received supplemental counseling during school hours that often disrupted her science work. In class, she was seldom called upon because the teacher did not want to single her out or embarrass her with questions she might not be able to answer. When her notebooks were examined, even during times of participation and attendance in science class, it was noted that she doodled and daydreamed. Even her notes on science lab report revealed different interpretations of the values of the science experiments when compared to the teacher's purpose. Often, her responses contrasted sharply with those determined to be the "right" answers. In short, the units of study based on recommendations by the AAAS did not seem to have much relevance to this child's lived experience. Equal opportunity alone was hardly sufficient in meeting this child's educational needs in science class.[26]

A feminist ethic challenges the pervasive forms of academic competition and standardization practiced in schools as these serve some to the exclusion of others and adhere to a faulty premise of earned privilege and honor. This requires a restructuring of many everyday practices apparent in schools since they fail to educate students for a critical citizenship in which questions of equity are routinely scrutinized. The notion that schools operate as meritocracies is challenged, and the historical roles schools have played in reproducing inequities according to social class, race, gender, religious affiliation, etc., are exposed.[27]

Conversely, the work of Osborne and Barton with children in homeless shelters reveals a more thoughtful and context-specific shift in both content and pedagogical method. As an example of support for emergent multiple literacies, the teacher allowed children to choose activities that resonated with their emerging critique of school-based knowledge. When she visited the center prepared to engage children in work related to some scientific concept, she was open and responsive to children's desires and initiatives. For example, when some boys made edible "paper" from some food supplies rather than recycled paper, she encouraged their exploration. Rather than use the provided materials for making paper, they borrowed items from the snack table and made edible "paper" to be consumed at a later time. This activity revealed for Osborne and Barton, a number of things. Originally, this activity exposed the ways the boys were making sense of and rebelling against the food restrictions placed upon them as residents of the shelter as well as the injustices in the lack of material necessities afforded to them as children. More importantly, the boys challenged the pedagogy by creating their own science. Lastly, this activity permitted children in homeless shelter to begin to shape some form of agency in relationship to the unfair political, economic, and social realities that surrounded them.

A feminist ethics combined with multiple literacies, then, is a broadened form of social ethics and actions that provide some promise for a deeper understanding of how the private and public domains intersect and how actions can disrupt traditional science practices that exclude some. This kind of understanding, for example, requires us, as teachers, to involve ourselves with matters of teaching simultaneously with a respectful understanding of children's lived experience. Moreover, it requires a development of a critical literacy that can critique. In this way, teaching and learning are based on the interests, needs, and

questions of children and are able to move into forms of practice that destabilizes and politicizes the boundaries of knowledge.

The role of the teacher resides in her/his abilities to guide children in the construction of questions and to work collaboratively to help answer them. The outside experiences and realities of children are validated by teachers and used to create pedagogical direction.[28] This standpoint situates curriculum within knowledge of power relations and the roles that specific content and teaching practice play in the ways diverse students' make sense of and construct their learning identities. Regarding this work within science education, Osborne and Barton state:

> We use these insights to create a forum where feminist conceptions of science and science teaching and learning are explored as a viable and liberatory alternative to contemporary science teaching methods for children. Investigating the ways in which the urban minority children we work with perceive science and themselves in relationship to science, we discover how these images and relationships change as students are encouraged to explore the meaning of science in the context of their lived experiences.[29]

Such an open and critical notion of science permits the possibility of creating spaces in which a wide range of roles can be examined and knowledge of science can be fluidly and reflectively constructed. In this way, children can create a science that combines their perceptions and insights with their everyday experiences and their personal beliefs and immediate needs. This challenges the dominant ideas about science and educational theory and practice of classroom instruction.

In the same way, a feminist ethic works to connect with students' communities and families. This respect of students' community and family among teachers is essential and extends beyond mere routine contact with families. Importantly, teachers must be willing to work extensively to bridge the gaps between families, communities, and themselves, despite differences in values, perspectives and desire.

A feminist ethics requires consistent reflection upon concrete situations. It focuses on the economic and social structures as they are experienced in the personal realm. This requires us to identify and engage in the specificity of the issue at hand. For example, feminist ethics expose a local company's practices that might be dangerous to the environment as it provides a discourse to understand the power relations embedded in the injustices at hand. All of this allows for intellectual growth as we evolve into deeply humane individuals. Each person must become one who is "simultaneously concerned about the other's welfare and perceives acutely and insightfully how it is with other."[30] A feminist ethics remains true to all of humanity in ways that require us to develop empathy about the human condition and desire to change the conditions of another's life. In our perception of the anxieties and frustrations suffered by others, we make the necessary connection in order to help change the conditions and situations in which others might suffer. This avowal requires teachers and others to be become actively involved in the specific situations that limit one's participation in and success with school.

A feminist ethics always accounts for surrounding circumstances. Nothing is viewed separate or outside of the historical, political, economic, and social moment that encircles it. The feminist efforts of PROMISE (Projects for Multicultural and Interdisciplinary Studies in Education) housed at the University of Nevada, Las Vegas provide an excellent pedagogical example. This curricular initiative for university

students integrates skills for analysis with specific content based in relationship to historical events, contemporary culture, social practices, and political policy within a feminist perspective. Gender relations, power, ethnicities, class, and sexuality along with other social categories are analyzed relative to the distribution of and knowledge generated within science.[31]

Modules were developed to guide this endeavor. One sample module entitled, "Water: Resources, Politics and Society," promotes understanding among students of human acts, humanity, and subsequent relationship to the cycle of water production. Perceptions about water, historical values related to water, and contemporary lifestyle uses of water are some of the concepts juxtaposed with studies of fluvial systems, geomorphology, and the hydrologic system. These first exercises provide opportunities for the development of a cultural literacy. As a result, scientific concepts are integrated with specific understandings of local cultural practices.

Introductory concepts require no previous science experience and progress toward application is made in context specific locales. Importantly, the work begins with self-reflective exercises that help student identify personal values and perceptions about scientific concepts or phenomena. In this case, students are asked to reveal what they know and understand about water, its production, use, and conservation. Activities arise from within this understanding and move outward to regard the larger implications in a social, cultural or political sense. Of course, for students who live in different geographical locations, the study of water, its production, use and cultural regard is context specific and can lead to greater understanding of local practices and belief. As a critical literacy discourse develops, questions of power and its relations are raised regarding a specific scientific concept and its cultural practice, and opportunities for activism and social transformation often occur. For example, in the case of this module on water, students who live in a southwest corridor of the United States may become involved in conservation organizations or other advocacy efforts that seek to change local understanding and cultural practices. Cultural Survival is one such advocacy group that is "dedicated to bringing together the Native rights and environmental movements to bear upon the issue of resource colonialism." [32]

The roots of oppression (as the cases above illustrate) can inform us of an ethical response; that is, a feminist ethics insists that we be willing to name others and ourselves as possible actors in the oppression of one group or another. Also, we must always ask whose experiences, under what conditions, for whose benefit are certain practices initiated and maintained in schools and society, at large.

Although usually regarded as legitimate, traditional ethics as practiced in schools, support the dominant paradigm in teacher education and curriculum and instruction. These traditional ethics exercise forms of moral regulation that suppress important questions about the relation among power, knowledge and domination. Such ethics for fairness, as an example, are widely practiced and regarded in schooling. Consider the idea spoken and understood in school as "what's fair for one, is fair for all", as an ethical stance. In our experience in one secondary public school, this example is adeptly depicted in a teacher conference among secondary subject area teachers. They were discussing adaptations for a high school student's educational plan in an advanced biology course. A student with a specific learning disability had modifications for testing and course evaluation along with other adaptations of the required curriculum components; these were presented to the teacher by the special education teacher and her parents. These modifications were designed to assist the student to be successful in this college preparatory class. The teacher named the alterations "unfair". He believed that since other students were required to complete certain requirements in order to earn a grade that would be considered in their college applications, everyone should do the same. What is missing from this discussion is a feminist ethical understanding of the specificity of this particular child's learning and social needs. Not only does her gender play an important role in her future placement within the academic setting and in her role in science, but also her locale as a student with a learning disability bears substantial significance too.

This vignette provides a poignant example of the contemporary notion of ethics widely practiced in schools that disregards the specificity of the individual student. Teachers who regard themselves as ethical humanitarians are, in fact, unnamed actors in a specific form of oppression that excludes and obstructs the work of others.

A feminist ethics among these teachers would insist that they examine their actions and work toward the development of a sense of empathy for the experiences and frustrations of their students, regardless of status and social affiliation. More than this, a feminist ethics reveals power and its relations to the real life experiences of all people. Analysis of power and its relationship with children's school experiences including the content of the curriculum and the instructional patterns sanctioned by schools would become part of our teacher education praxis. Curriculum and instruction that is context-specific, integrated with social, cultural, political, and economic realities of our world and attuned to the lived experience of children, form the basis for a feminist ethics in teacher education.

Summary

Science educators are revamping their curriculum in order to address contemporary issues and create programs that reflect the new social and cultural configurations found in the wider societal context.[33] We propose a radical rethinking of curriculum, position, and pedagogy of multiple literacies within a feminist ethic in the practice of education. Such multiple literacies within a feminist ethics can guide us as we shape the reform of teacher education. Our examples illustrate feminist ethics used to critique current curriculum content;[34] to envision new curriculum content within a feminist ethics (PROMISE); to guide new pedagogies and forge new relationships among teachers, schools, families and children. The creation of interdisciplinary work is contextualized and specific to the needs and desires of children. The application of academic concepts to the larger political, social, cultural, and economic realities of our world is made. Students are actively engaging students in the process of creating new knowledge; and the emergence of a critical consciousness among teachers and children emerges in the efforts of all that seek social transformation through ethical action for justice.

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Technology Integration in Professional Education Courses: Utilizing the INTASC Principles

Saundra L. Wetig and Phyllis K. Adcock

Introduction

In response to emerging federal, state, and local standards, the University of Nebraska at Omaha through the Teacher Education Department strives to equip teacher candidates with the academic, social, as well as the technological skills needed in 21st century classrooms. The teacher preparation program provides teacher candidates with a systematic, experience-based approach to develop the requisite knowledge, skills, and dispositions which align with local, state, and federal standards relating to curriculum structure and content knowledge.

After the most recent National Council for Accreditation in Teacher Education (NCATE) accreditation visit, the College of Education Teacher Education Department reviewed the professional sequence of courses, known as the E-Core courses, to determine what cognitive knowledge, skills, dispositions, and technology competencies were embedded in those courses. The E-Core faculty worked to then align those knowledge, skills, and dispositions, required of teacher education candidates, with the NCATE Standards and Interstate New Teacher Assessment and Support Consortium (INTASC) Principles.

More recently, the department chairperson brought the team leaders of the E-Core faculty and the technology support staff together to discuss how NCATE and the INTASC Principles have impacted those courses. The discussion centered on the course expectations, requirements, and technology integration in the five E-Core education courses. The E-Core team looked specifically at the cognitive and technological knowledge, skills, and dispositions included in the five educational core courses required of all COE students: (1) EDUC 2010 Human Growth and Learning; (2) EDUC 2020 Educational Foundations; (3) EDUC 2030 Human Relations; (4) EDUC 2510 Applied Special Education; and (5) EDUC 2520 Instructional Systems.

Once the cognitive and technological competencies were identified, the E-Core team determined that some type of exit assessment was needed to document teacher candidates' cognitive growth and technological competence in relation to the INTASC Principles. It was then they decided to utilize the ten INTASC Principles to provide the framework to document progress of the teacher candidates'

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knowledge, skills, and dispositions to serve as a form of exit assessment of teacher preparation. Concurrently, the technology support staff developed an online digital portfolio that E-Core titled the Digital Showcase. This digital portfolio includes a summary of each of the INTASC Principles and a scoring rubric for the teacher candidates. Therefore E-Core faculty members are able to document and record the individual teacher candidate's progress as they correlate to the INTASC Principles. (See Table 1.)

Table 1

INTASC Principles and Supporting Course Activities Table

University of Nebraska-Omaha

Principle 1: Content Knowledge	**EDUC 2020** Teacher Interview **EDUC 2520** Unit Teaching Plan (K-12th grade)
Principle 2: Learner Development	**EDUC 2010** Non-traditional Remote Observation Technology
Principle 3: Diversity of Learners	**EDUC 2510** Modification/Adaptation of a Lesson Plan for a Special Needs Student
Principle 4: Instructional Strategies	**EDUC 2520** Unit Teaching Plan (K-12th grade) EDUC 2520-004 Schema Representations via Inspiration
Principle 5: Learning Environment	**EDUC 2010** 5 Level Observation Form **EDUC 2030** Forum/Image Theatre
Principle 6: Communication	**EDUC 2510** Modification/Adaptation of Lesson Plan for a Special Needs Student
Principle 7: Planning for Instruction	**EDUC 2020** Philosophy of Education **EDUC 2520** Unit Teaching Plan (K-12th grade)
Principle 8: Assessment	**EDUC 2510** Checklist for Special Needs Identification
Principle 9: Reflective Practice and Professional Development	**EDUC 2020** Pre/Post Technology Plan for Professional Growth & Development **EDUC 2520** Well-Remembered Events Journal
Principle 10: Community	**EDUC 2020** Ethics Activity **EDUC 2520** Student Teaching Brochure

Application of Technology in Education Courses

In the teacher preparation program at the University of Nebraska at Omaha, students are required to take EDUC 2010 Human Growth and Learning, and EDUC 2020 Educational Foundations as the first two courses in their professional education sequence. Both classes have various reflective thinking activities that are submitted to students' digital portfolios. By using the digital portfolio, students have the opportunity to integrate technology into their reflective learning experience, which hopefully will be carried later in their role as teacher. The learning activities that are submitted in the digital portfolio will help students understand how technology can be an effective tool in teaching and learning.

Two other examples of the integration of technology in the professional sequence of courses are found in EDUC 2520-004 Instructional Systems. This course provides students with the basic aspects of curriculum design and implementation, in which students must complete a project entitled Effective Instruction through Schema Representations. In this same course, students also use BlackBoard to produce their field reports which are entitled Well-Remembered events, that are based on the students' observational experiences. These four technology-integrated courses provide students with rich technological experiences, which are supported by the INTASC Principles. Each of these four examples of technology integration in the EDUC courses is described below in detail.

Digital Portfolio

The digital portfolio has many advantages in a teaching and learning situation. The teacher can provide an individualistic approach in the learning activity which is quick in submission and response, and this medium gives evidence of learning through the pre-service teacher candidate's years in school.[1] The digital portfolio provides teachers and students the advantage of immediate interaction, without the limitation of a specific time or a specific classroom. Therefore, the digital portfolio provides the teacher and student with real evidence of learning through a process and product learning experience.

In EDUC 2020 Educational Foundations, students can experience reflective thinking through an assigned ethics activity in the digital portfolio. Students submit a basic definition of ethics which reveals their philosophy and disposition as pre-service teacher candidates.[2] Next students visit a list of Websites on the topic of ethics, which allows the student to further expand their views of ethics. At that point, students can revise their basic definition of ethics, which is then submitted as a revised ethical statement. Then, students are expected to find an ethical clash in the print media, which allows them to apply the revised statement of ethics, and submit their response to their ethical clash on the digital portfolio. After completion all of the steps to this ethics activity, the faculty member can choose either to have students resubmit their paper for further work or to grade the submitted paper as is on the digital portfolio.

Teacher candidates who are actively involved in this constructivist activity discover the connection between teaching and learning, and, therefore, the role of the teacher and the learner is better understood.[3] They see themselves as the learners of concepts, which are built on previous learning, making the learning experience more effective. They also see the teacher as the facilitator or scaffolder who supports the student as they progress through various learning activities.

By placing the ethics activity in the digital portfolio, the students' work can be archived and used as a reflective measure of the student's ethical beliefs to be used in future classes, or a means of marketing of their learned competencies for future employers. This is one example of the commitment of department faculty to use forms of formative, summative, and marketing digital portfolio activities in their classes for a program-wide integration of technology into the professional education sequence courses that is in line with the INTASC Standards.

Alternative Observation Technology System

At the University of Nebraska at Omaha, federal funding was secured for a two-way audio/video conferencing system. A two-way conferencing connection is possible through a computer's Internet protocol number that allows remote viewing of any classroom with Ethernet connections to the Internet. A port in the firewall, which blocks incoming and outgoing electronic traffic, must be opened at each site to allow for the two-way connection. A T-1 line of a high bandwidth is preferred to handle the high traffic these audio/video connections generate. Keep in mind that it is the amount of Internet traffic an institution has that can make a difference, especially in the video display.

In EDUC 2010 Human Growth and Learning, university students have five observation experiences at the preschool, kindergarten, special education, elementary, and secondary levels, which are guided by field competencies. A two-way audio/video conferencing system is being used for Human Growth and Learning classes as a tool of technology for alternative observations of classrooms in the school community.

This conferencing system allows for two-dimensional viewing of the classroom through a camera that is about eight inches high and four inches wide and is virtually soundless. The microphones are placed strategically around the room to pick up the voices of the teacher and the children. At the university site, the camera is controlled to follow the learning activity, such as following the teacher in large group setting or zooming in on small group activities. Through this experience, university students can gain an understanding of how children learn,[4] in what type of setting, and how children differ physically, intellectually, and socially.[5]

The remote video observation can be taped, which gives the university classes flexibility for viewing during class or at a later time, for example with evening classes. This taping feature is also helpful with children's classroom schedules which do not provide quality observation time, such as when a child is engaged in quiet reading time, or when children are away from the classroom for lunch and other activities.

The remote observation experiences works best with the younger and special needs child, due to the great opportunity for interaction with the classroom and other students, and it is no more intrusive to the school classroom than the traditional on-site visits. With the continued success of this alternative observation method through the conferencing system, colleges and universities can provide quality observational experiences by integrating distance learning technology into teacher preparation program classes.[6]

Schema Representations via Inspiration

All students in the teaching preparation program (elementary, secondary, health and physical education, music and art education, and speech and language pathology) are required to take EDUC 2520 Instructional Systems. This course orients pre-service teacher candidates with the basic aspects of curriculum design and implementation. The course includes such topics as: (a) instructional delivery strategies

based on the assessment, prescription, implementation, and evaluation model of the College of Education; and (b) educational technology selection, design, production, utilization and evaluation. This course seeks to help teacher candidates understand the role of the teacher as the orchestrator of the learning environment and the integral part these topics play in that role.

In an effort to integrate the pedagogical knowledge with the technology skills learned through the course, students in EDUC 2520-004 are required to complete a project titled, "Effective Instruction through Schema Representations." Nietfeld defined a schema representation as, "...similar to a concept map in that the goal is to present a graphic representation of a primary concept along with all of the peripheral and interlocking nodes of information associated with the concept."[7] The goal of this project is to encourage students to think about the pedagogical and technological knowledge they learned regarding effective instruction and then represent the data in a creative format using a schema representation.

Throughout the semester students receive information on the following topics: (a) characteristics of effective teachers; (b) student diversity; (c) instructional strategies; (d) unit and lesson planning; (e) questioning strategies; (f) classroom management; and (g) assessing student learning. Toward the end of the semester, students are required to complete a preliminary concept map based upon the instructional delivery strategies of assessment, prescription, implementation, and evaluation. The students are required to develop their schema representations around a visual metaphor, graphic, or theme. Once they have completed this step, the next task is to fill in the visual graphic with the pedagogical knowledge they have acquired in this course and past courses. The schema representations become diagrammatic representations that demonstrate meaningful relationships and connections between instructional delivery strategies and the relationship to effective instruction.

Students attend a tutorial session on how to use the Inspiration software application. Utilizing the data on the concept maps, the students then design schema representations in Inspiration. The tools within Inspiration make it simple for users to prioritize and rearrange ideas to create clear, concise schema representations. The schema representations built in Inspiration go beyond concept mapping by allowing for more creative formats.

Upon completion of the project students place the completed work in their digital portfolio. This project provides an integral link between pedagogical knowledge and demonstration of that knowledge in a creative format. The schema representations assist students in evaluating the process and many facets of effective teaching and practice through development of a mental model. This mental model requires pre-service teachers to synthesize and personalize their understanding of effective teaching around the areas of assessment, prescription, implementation, and evaluation, all of which form the foundation of the course.

"Well-Remembered Events" via BlackBoard

Today's education landscape is characterized by a greater demand for anytime/anywhere learning. As we move into the 21st century, technology has become a significant part of how teacher candidates are trained. The university Information and Technology Service has provided faculty and students with the opportunity to utilize the Web-based server software system titled BlackBoard. BlackBoard serves 5.4 million active users, with more than 1,900 live institutions.

Our university is one of eleven educational institutions in Nebraska utilizing BlackBoard.

In the Instructional Systems course students are required to complete twenty observational hours in an assigned school setting. The placements are made in socioeconomically diverse elementary, middle, and high school settings. Throughout the 20 hours, pre-service teacher candidates are required to complete field reports that are titled "Well-Remembered Events." The field reports are guided by questions based on the clinical aspects of assessment, prescription, implementation, and evaluation. In an effort to utilize the Web-based server available, students are required to place their events online through the tool in BlackBoard called Discussion Board.

Discussion Board is utilized as an additional communication tool, moving students beyond routine class discussions. Following observations and participation in the schools, pre-service teacher candidates are required to respond to questions, which are set up in forums. Discussion Board is used in a manner similar to a virtual chatroom. By requiring students to engage in self-reflection and evaluation, it is hoped they will make connections regarding the pedagogical aspects of assessment, prescription, implementation, and evaluation.

Conclusions

The E-Core team, which is made up of the faculty team leaders of each of the professional educational sequence of courses, looked specifically at the five educational core courses required of all College of Education students. Those classes that are required for this sequence are: (1) EDUC 2010 Human Growth and Learning; (2) EDUC 2020 Educational Foundations; (3) EDUC 2030 Human Relations; (4) EDUC 2510 Applied Special Education; and (5) EDUC 2520 Instructional Systems.

The E-Core faculty identified cognitive knowledge, skills, dispositions, and technology competencies that were imbedded in this professional education sequence. These knowledge, skills, and dispositions, which are required of teacher education candidates through NCATE and the INTASC Principles, were then aligned with NCATE and INTASC to ensure that the department was meeting their responsibilities to their students who completed the teacher education preparation program.

The College of Education technology support staff then developed an online digital portfolio, which includes a summary of each of the INTASC Principles and a scoring rubric. This digital portfolio allows faculty members to document and record the individual teacher candidate's progress as they correlate to the INTASC Principles. Each of the professional sequence of courses, or the E-Core classes, is assessed utilizing the rubric based on these principles.

The E-Core faculty has made a commitment to implement the use of a digital portfolio as a means of integrating technology into education. This commitment affirms that all E-Core faculty, including adjunct faculty, are using forms of formative, summative, and marketing digital portfolio activities in their classes for a program-wide integration of technology into the professional education sequence courses. This commitment can be seen in the four examples mentioned above in the application of technology integration in the professional sequence of courses.

Educational leaders discuss how good teaching is evaluated through what one knows and is able to do.[8] At the university, the E-Core faculty is committed to the use of the digital portfolio as the device which will showcase what a pre-service teacher candidate knows

and is able to do. The digital portfolio is able to do this through an electronic medium that is faster, if not an easier, method of delivery. The faculty can use the digital portfolio to help in the setting of goals based on the INTASC standards and the reflection of those goals in products submitted to the digital portfolio throughout the students' teacher preparation.

We have an obligation as teachers to help our pre-service teacher candidates become higher-order, conceptually-based learners and thinkers. It is critical for teacher educators to continue personal modeling of technology as an aid to instruction and as a tool to engage students in higher-order/conceptually-based dialogues. Jackson states in his discussion on transformative teaching: "It is essential to success within that tradition that teachers who are trying to bring about transformation changes personify the very qualities that they seek to engender in their students." [9] It is hoped that as teacher candidates are engaged in purposeful, yet guided, online dialogue they will begin to become higher-order, conceptually-based learners through the experience.

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The Need for a Comprehensive Competency-Based Career Guidance Curriculum for Teen Mothers

Mary-Beth Muskin

Introduction

Teen parenting has significant implications for teens and their success in school. As school guidance and counseling departments focus on the development of comprehensive competency-based guidance curriculum within their school systems, the needs of teen parents are often overlooked. The development of a comprehensive competency-based curriculum that augments the curriculum for teen parents regarding self-esteem, academic achievement, school attendance, school completion, and future goals provides the opportunity to address the issues that are paramount to meet the needs of this population. This article describes a comprehensive curriculum which was developed in an effort to increase self-esteem among teen parents and support their ability to complete their high school education and plan for the future.

Background

Although the pregnancy rate for teens has decreased over the past ten years, the United States has a higher teen pregnancy rate than any other industrialized nation.[1] Stereotypes continue to reinforce the societal perception of reasons teenagers become parents. Kiselica and Pfaller state that unmarried teenage mothers are viewed as violating a cultural norm and that work with teen mothers should focus on prevention and intervention.[2] Other research indicates a different understanding of the teen parent's perception of childbearing. Myrick argues that in our culture adolescent childbearing is viewed by some adolescents as a career choice.[3] It is important then to look at the implications of childbearing as a career choice, and the role schools have when working with teen mothers. The work of Kiselica and Kessler suggests that school counselors view both teen mothers and fathers as needing a host of psychosocial services.[4] In addition, teen mothers generally need assistance in providing for the physical well-being of their children. To that end, this article focuses on the development of a comprehensive competency-based career counseling curriculum to meet the needs of teen mothers.

Curriculum Development

Guiden writes that prevention efforts make a significant difference.[5] Additionally, Johnson-Moore's research documents that increased knowledge, enhanced interpersonal relationships, and augmented parenting skills made a difference in the teen mothers' approach to parenting.[6] While parenting might have been an initial career goal, there is a need to support teen mothers as they realize that they can set future goals. Teen mothers typically have more complex issues to deal with than the average teen as they try to raise a child, stay in school, and balance financial needs. Farrell notes that poverty and lack of vocational training make it virtually impossible for most teenagers to independently support their children.[7]

Teenage parenthood is viewed as a social problem requiring a collaborative approach to envision lasting, positive outcomes. Kiselica and Pfaller argue that teenage parents are an at-risk group with a multitude of needs and that the most effective interventions will include counseling professionals from a variety of disciplines working alone and together.[8] School counselors are in a pivotal position within the schools to offer this kind of support. Comparing traditional counseling programs to student needs clarifies the variety of guidance methods, techniques, and resources available. Gysbers notes that student needs coupled with the increased expectations of policymakers and consumers indicate that a new structure for guidance programs in the schools is needed to meet the needs of the total school population.[9] Neuberg and Barr recommend comprehensive competency-based guidance and counseling programs for all students from kindergarten through high school.[10] School counselors need to be proactive in their approach to working with students in their personal, social, academic and career development. School counselors can reach these goals through the implementation of comprehensive competency-based guidance programs.
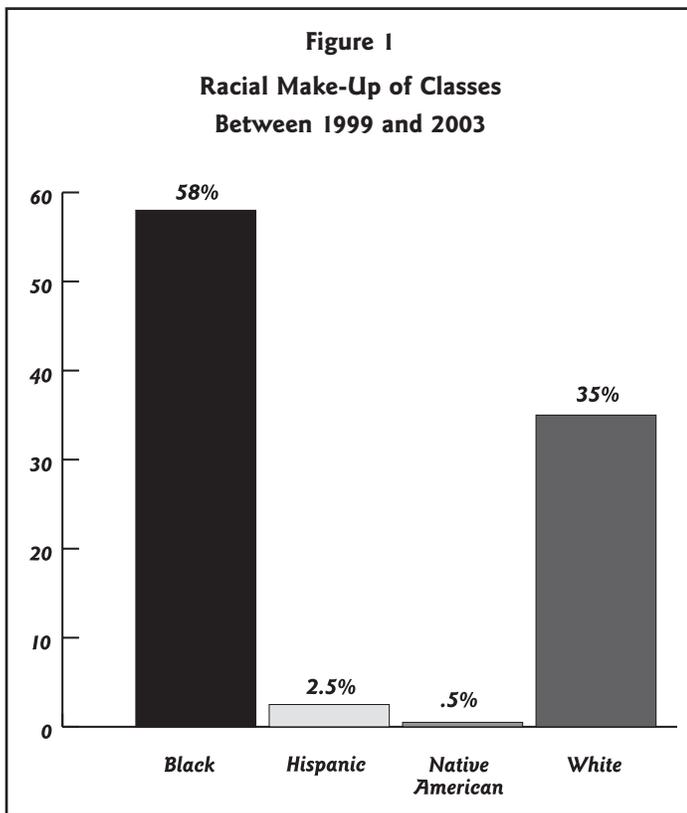
A comprehensive competency-based guidance curriculum addressing the specific issues of teen mothers can only be established through the strong support of the counseling department, staff, and school administration. An already established comprehensive competency-based counseling program within the school or district greatly enhances the chances of successful implementation of an adjunct curriculum adapted to meet the special needs of teen mothers. Comprehensive competency-based counseling provides an opportunity for early identification of teen parents and an adapted curriculum to meet the specific needs of teen mothers through individual, small group, and large group counseling. When adolescent childbearing is viewed as a career choice, it can have direct implications for the counseling curriculum. The research supports the development of a strong career-focused comprehensive curriculum that reinforces parenting skills and supports students in the completion of high school and in the planning of a career beyond high school.

The American School Counselor Association has published national standards to assist with the development of counseling curriculum that complements school curriculum.[11] The national standards provide direction to directors of counseling programs as counselors make the transition from traditional programs to comprehensive counseling programs. Myrick defines the counseling curriculum as a planned effort to provide each student with a set of skills and experiences that help enhance all learning.[12] A review of the literature indicates that we can learn from the literature on general curriculum development, and much has been written about the need for comprehensive competency-based guidance. However, little has been specifically written about the criteria for the development and evaluation of a counseling curriculum that focuses on the needs of teen mothers.

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Background Information for Curriculum Development

The public school selected for this study is a math/computer/ technology magnet school located in a city of approximately 400,000 population. Students from all parts of the district attend this high school. There are more than 1,700 students in grades 9-12. The school is racially and culturally mixed. (See Figure 1 for a breakdown of the racial make-up for the 1999-2003 school years.)

Figure 1

Racial Make-Up of Classes

Between 1999 and 2003

The first step in the development of a Career Guidance Curriculum focused on meeting the special needs of the target population which in this case was, teen mothers. Since competencies need to be com- prehensive, it was important that an inclusive approach be taken in their development. Approaches used for gathering information on the specific needs of teen mothers to be addressed through the compe- tencies included;

1. A review of national trends as reported in professional journals;
2. A needs assessment that addresses staff concerns, student concerns, and parent concerns;
3. Informal teen parent meetings;
4. Completion of a learning styles inventory.

A review of the literature helped to reinforce the issues raised by teen mothers and staff concerns as well as uncover areas that might have been inadvertently omitted. Caution was taken when reviewing the literature so that national trends were evaluated for district, school, and classroom relevancy.

Through the development of a needs assessment, input from the target group was procured. Utilization of a needs assessment enhanced the process by facilitating the acquisition of consistent information on what teen mothers, their teachers, and parents felt was important.

Informal meetings with teen mothers uncovered additional valuable data, reinforcing that teen mothers often viewed becoming a parent as an intentional decision and motherhood as a career. The teen mothers often didn't know the magnitude of their decision until they were discussing all the issues informally and brainstorming issues and solutions as a small group.

Identified competencies needed to be perceived as relevant in meeting the needs of the teen mothers and then developed as comprehensive. Understanding the importance of competency development to the overall success of the curriculum reinforced the importance of the needs assessment and informal groups in gaining necessary information for their development. The student and staff responses assisted in the adaptation and identification of relevant competencies for curriculum development giving an understanding of what the population thinks is important. Staff, school, and community needs were also considered.

An informal assessment of needs was administered to students and staff through a school-sponsored parenting class offered as a credit course for teen parents prior to the initial development of the targeted curriculum. Each teen mother enrolled in the teen parent class was individually interviewed. Thirty-eight interviews were completed over a four year period. Twenty-seven students were enrolled in the parenting class for one year; ten students were enrolled in the class for two years, and one student for three years. Interviews were completed upon the student's entrance to the class. Through the interview students discussed their pregnancy, relationship with the father of their baby, medical care, legal issues, academic issues, career aspirations, support systems, and frustrations. Additionally, informal discussions were held with the classroom teacher, school nurse, and school and district administrators to assist in the identification of teen mother needs.

Results of the assessment indicated that general student concerns centered around taking care of the babies' medical and emotional needs, getting a job, finding sources of help, and managing time so that they could stay in school and continue with career and future planning. Staff concerns centered around school completion and career planning. Administrative concerns focused on the need for an enhanced curriculum that would specifically address these needs.

The C.I.T.E. Learning Styles Inventory was administered to 16 students.[13] The Learning Styles Inventory is divided into three main areas: Information gathering/receiving; social work conditions; and an expressive preference. Results of the C.I.T.E. Learning Styles Inventory indicated that a majority of students (n=8) preferred to learn using the Auditory/Visual Kinesthetic style. Learners preferring this style learn best through experience and involvement. It is helpful if the leaner can handle, touch, and work with what they are learning. There was no assessed non-preferred style for nine students. One student had non-preferred styles with no clear preferred style, and one student had no preferred or non-preferred style. See Table 1 for results of the C.I.T.E. Learning Styles Inventory. Results of the learning styles inventory were considered as individual lessons were developed to meet the competencies.

Teen Mother Comprehensive Competency-Based Career Curriculum

The school system used as a site for curriculum development and implementation has a comprehensive competency-based counseling program in place. The teen parent competencies were developed in conjunction with information gained from the literature review, needs

Table 1

C.I.T.E. Learning Styles Instrument Results

Student (n=16)	Visual Language	Visual Numerical	Auditory Language	Auditory Numerical	Auditory/ Visual Kinesthetic	Social Individual	Social Group	Expressive Oral	Expressive Written
Student A				+					
Student B	–		+		+			+	
Student C						–	+		
Student D	+	+							
Student E					+				
Student F	–							–	
Student G	+	+	+		+				
Student H		+	+						
Student I			+		+				
Student J			–		–	+	–		
Student K								+	
Student L		+	–		+				–
Student M									
Student N		+			+			+	
Student O	+	+	+		+	+			
Student P					+		–		–

assessment and the already existing counseling competencies developed by the district as well as the teen parent program curriculum. Additionally, there was a review of already existing district career services. Competencies were developed to provide the foundation for the goals of the teen parent counseling curriculum. The competencies provided the foundation for curriculum design, driving all curriculum development and providing the foundation for curriculum assessment.

Students and staff identified four areas of importance for inclusion in the teen parent guidance curriculum. These areas included: (1) services available within the community; (2) information about pre/postnatal care and early childhood; (3) medical issues; and (4) career planning and job experience. A four-pronged approach was used in the development of a comprehensive curriculum to address these needs. Curriculum components include community service, speaker's bureau, career and future planning, and service-learning. (See Figure 2.)

The community services component provides students with the opportunity to learn about necessary services available to them within the community. Students, under the direction of the counselor and the classroom teacher, discuss the issues that are most immediate to their lives. Examples include insurance, childcare, and community resources. Speakers are scheduled during class time to address the most important issues. Students choosing to take this class learn about social services available to assist with support (e.g., WIC and state insurance funds), common medical issues, and child development expectations. Students learn how to select necessary services to best meet their needs and the needs of their child.

The second component is a speaker's bureau. The speaker's bureau taps into speakers from the local medical center and the community at large. Speakers are invited to work with students and speak about medical and parenting issues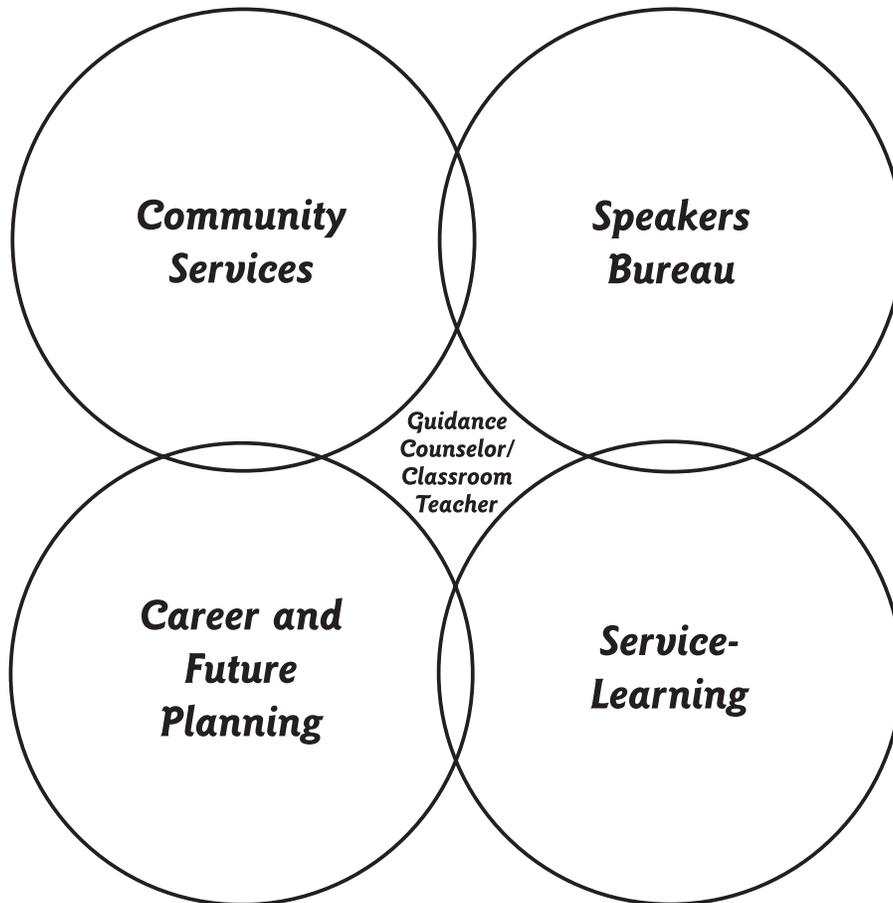. Through a tailored curriculum, teen parents learn about their baby's needs, normal infant and toddler development, and childhood diseases.

The third component focuses on decision-making and planning for the future. Students, through academic, aptitude, and interest inventories, start to define what their interests are and to develop realistic goals and plans for the future. A focus on career counseling in the teen parenting class over the past four years has provided this class of students with the opportunity to realize that they can set and reach long-term career goals. A career guidance unit, focusing on decision-making skills, problem solving, and resume writing, was designed and piloted. The specific curriculum was designed in conjunction with the school systems comprehensive competency-based guidance program. Seniors additionally focus on setting realistic post high school goals. Students choosing to continue their education after high school graduation work on completion of applications, scholarship forms, and entrance exams in keeping with their future plans. Over the past four years, each group of students choosing to continue their education has been successful in receiving numerous scholarships to assist with expenses and, in many cases, cover tuition and living costs. Students choosing to work decide on their areas of interest and evaluate their resumes and interviewing skills in preparation for finding an appropriate job after graduation. Every teen mother develops a post graduation plan and spends the year working toward the implementation of that plan.

The fourth component of the curriculum focuses on service-learning. Students serve required volunteer hours at a daycare centers providing 14 hours of support to the center. In return, students see positive role modeling and receive direction in working with their children. Additional volunteer experiences are available for teen mothers to participate in so that they can gain the necessary experience needed

Figure 2

Four-Pronged Approach to Teen Mother Comprehensive Competency-Based Guidance Model

Community Services

Speakers Bureau

Guidance Counselor/ Classroom Teacher

Career and Future Planning

Service-Learning

to compete for positions in today's society. They are learning to become good citizens. It is through volunteering that students can gain insight into good parenting and other skills while feeling good about giving back to the community.

The comprehensive competency-based career guidance curriculum was piloted over the course of a year. Curriculum continues to be adjusted after the initial pilot based on student responses and the results of the learning styles inventory.

Conclusion

The creation and implementation of a comprehensive competency-based guidance curriculum that specifically meets the needs of teen mothers requires district and school support. Curriculum development can be developed and implemented through careful planning in the initial stages. Open communication with and inclusion of students, teachers, administrators and community members in the initial stages help to build a commitment to the curriculum and add to its relevancy. It is of paramount importance that time be taken in the initial and final stages to glean input from all who have a vested interest in guidance and counseling. Successful implementation is dependent on enthusiastic commitment by teen mothers, teachers, counselors, administrators and community members.

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FALL 2001: a general issue of submitted manuscripts on education funding.

SPRING 2002: a general issue of submitted manuscripts on education-related topics.

FALL 2002: a theme issue on critical issues in higher education finance and policy. Guest edited by Marilyn A. Hirth, Purdue University.

SPRING 2003: a theme issue on meaningful accountability and educational reform. Guest edited by Cynthia J. Reed, Auburn University, and Van Dempsey, West Virginia University.

FALL 2003: a theme issue on issues impacting on higher education at the beginning of the 21st century. Guest edited by Mary P. McKeown-Moak, MGT Consulting Group, Austin, Texas.