NOVA SCOTIA
TEACHERS UNION

PRINCIPLES FOR THE INTEGRATION OF TECHNOLOGY

IN PUBLIC SCHOOLS AND THE COMMUNITY COLLEGE

May 2002

NOVA SCOTIA TEACHERS UNION

PRINCIPLES FOR TECHNOLOGY INTEGRATION IN PUBLIC SCHOOLS AND THE COMMUNITY COLLEGE

1 While technology tools can enhance the ability of teachers to deliver educational programs and enrich the educational environment for students when applied in a pedagogically sound manner, people are the most important resource in the teaching/learning process.

2 Technology should be used as a tool to improve the quality of student-teacher relationships and not to replace teachers.

3 Technology must be integrated into the school system with consideration for equity of opportunity for students.

4 All school boards and the Community College should articulate a vision statement and long range plan for the integration of technology into the curriculum.

5 Teachers require access to appropriate, comprehensive, flexible, and ongoing professional development opportunities in the effective integration of technology.

6 Developing and maintaining a technology-integrated school environment requires an increase in teacher preparation time.

7 Teachers own what they create and are entitled to the protection of Canadian Copyright Laws.

8 In order to effectively integrate technology into the curriculum, every teacher requires access to a computer and an Internet connection both in the workplace and at home. This access is primarily the responsibility of the employer.

9 Technology infrastructure (hardware, software, consumables, technical support, professional development) must be in place prior to implementation of technology initiatives in order to achieve the intended curriculum/information technology outcomes.

10 Technology requires ongoing budget support for technicians, upgrading of hardware and software, and consumable supplies in order to be effective.

11 Technology maintenance and network administration are primarily the responsibility of board/ school technicians and not teachers.

12 The Nova Scotia school system must be protected from inappropriate corporate intrusion resulting from pressure to place technology in schools.

ad hoc Committee on Technology

FINAL REPORT

NSTU PROVINCIAL EXECUTIVE
FEBRUARY, 2002

TABLE OF CONTENTS

MANDATE

At the April 9, 1999 meeting of the Provincial Executive, an ad hoc Committee on Technology was struck to:

- develop NSTU Principles on Technology
- coordinate professional development activities in technology
- prepare NSTU position papers on aspects of technology
    - o implementation
    - o curricular integration and best practices
    - o resource materials
- other activities emanating from the NSTU action plan

The Provincial Executive at the September, 1999 meeting assigned the additional mandate of Council Resolution 99-54 to the ad hoc Committee on Technology due to the overlap in mandates.

Resolution 99-54

BE IT RESOLVED that the NSTU establish a task force to study aspects of technology in schools including, but not limited to:

(a) the availability of technology in all schools;
(b) technical support staff available to schools;
(c) the possibility/feasibility of establishing Internet access to all teachers from their homes;
(d) professional support staff for schools

COMMITTEE MEMBERS

Reg Johnston, Chair ..... Cape Breton Local
Jim Boudreau ..... Executive Member
Linda MacIntyre ..... Lunenburg Local
Alan MacKinnon ..... Inverness Local
Earl Rutledge ..... NSTU Staff Liaison

DISPOSITION OF MANDATE

Resolution 99-54

BE IT RESOLVED that the NSTU establish a task force to study aspects of technology in schools including, but not limited to:

(a) the availability of technology in all schools;
(b) technical support staff available to schools;
(d) professional support staff for schools

In order for the committee to develop NSTU Principles on Technology, the first priority identified by the committee was to listen to the teachers across the province in both the public school and in the Community College systems. The data, collected through a series of focus groups at the Local level, and a written survey of public school administrators were presented at Council 2001 – **"Technology Integration in Schools: *a Classroom Perspective*"**. This report to Council 2001 fulfilled the mandates of Resolution 99-54 a, b, and d, as well as providing insights on:

- implementation of technology
- curriculum integration and best practice issues
- and access to technology resources

as identified in the original mandate of the committee.

Resolution 99-54 (c) …study the possibility/ feasibility of establishing Internet access to all teachers from their homes

In order to complete the mandate, the committee approached the major Internet providers in the province with an offer to place a free advertisement in a special supplement of the January 2002 issue of *The Teacher*. An invitational letter was sent in November, 2001 to seven regional Internet providers but the committee did not receive a single response. Focus group and survey results show that 68% of teachers already have personal Internet accounts and perhaps this reduced the incentive for special rate offerings to teachers.

April 9, 1999 Provincial Executive mandate

- *Coordinate professional development activities in technology*

Since the formation of the ad hoc Technology Committee, the NSTU has assigned an executive staff officer responsibilities in the area of educational technology initiatives.

The NSTU has entered into a partnership with Mount Saint Vincent University and the Department of Education to use the Apple Computer Learning Interchange engine to develop resources and professional development opportunities for teachers. The Nova Scotia Learning Interchange (NSLI**)** provides a daily updated Web site for teachers with information on learning resources, searchable units of practice, and professional development articles. Much of this resource material has been produced by Nova Scotia teachers.

The NSLI conducted three regional workshops in Metro, Cape Breton and Digby during the spring and fall of 2001. These three-day Design Studio workshops provided professional development on instructional design and an opportunity for approximately 55 teachers to develop Units of Practice for the integration of technology into the curriculum of public schools.

- Develop NSTU Principles on Technology
- Prepare NSTU position papers on aspects of technology
    - o Implementation
    - o Curricular integration and best practices
    - o Resource materials
- Other activities emanating from the NSTU action plan

Based on the information collected from teachers and administrators for response to Resolution 99-54, review of pertinent literature, and presentations made to the committee, the following Principles on Technology have been developed on behalf of the NSTU. These principles reflect comments from the field and are based on best practices in technology implementation within the curriculum. In the view of the Committee, these principles define a framework for the "appropriate role of technology" as identified in the 1999-2000 NSTU Priority Goals.

NOVA SCOTIA TEACHERS UNION

PRINCIPLES FOR TECHNOLOGY INTEGRATION IN PUBLIC SCHOOLS AND THE COMMUNITY COLLEGE

1 While technology tools can enhance the ability of teachers to deliver educational programs and enrich the educational environment for students when applied in a pedagogically sound manner, people are the most important resource in the teaching/learning process.

Educators have always used technology in instruction. The technology is sometimes the object of instruction *(how does this work?)*, sometimes a tool to deliver instruction (video, text book), and sometimes a tool to assist students to explore their world (camera, pencil and paper, word processor, Internet).

In the current surge of computer and information technology development common wisdom has it that we must focus our curriculum on teaching students this technology. The words of John Ralston Saul offer a caution to such an about face in our curriculum goals:

> *"Concentration on technology will simply produce obsolete graduates. The problem is not to teach skills in a galloping technology, but to teach students to think and to give them the tools of thought so that they can react to the myriad changes, including technological, that will inevitably face them over the next decades." (The Unconscious Civilisation, 1995 Anansi Press pg. 66)*

The Nova Scotia Public School Program states that public school education in Nova Scotia has two goals: *"to help all students develop to their full potential cognitively, affectively, physically and socially; to help all students acquire the knowledge, attitudes and skills necessary for them to continue as thinking, learning, physically active, valued members of society"*. Students who graduate from high school with the ability to use their minds well will be in the best position to achieve these life long learning goals. These goals are best achieved by placing our students in the care of professionally trained educators who design learning environments and experiences to meet the educational needs of students.

2 Technology should be used as a tool to improve the quality of student-teacher relationships and not to replace teachers.

All distance education courses provided to public school students shall be taught by certified teachers.

When all is said and done, teaching is a human activity which requires respect for the role of both teacher and learner. The challenge facing educators and society at large is to build a more humane society using our machines and imaginations, and not to use technology as a tool to further dehumanize and alienate us. A shovel can be used to plant a seed or to destroy a root.

3 Technology must be integrated into the school system with consideration for equity of opportunity for students.

The Department of Education is responsible to ensure that a minimum standard of technology is provided for students and teachers in all public schools and Community Colleges in Nova Scotia.

Teachers across the province expressed concerns for the disparity of access to technology between grade levels, subjects, and school facilities at the focus group sessions. The growing digital divide can result in unequal opportunities for students.

The issue of socioeconomic conditions and the impact on student ability to get appropriate technology access at school and home was often identified as a concern by teachers. Many students are experiencing an even greater gap in access to quality learning opportunities due to unequal access to expensive computer technology at home. Many of these same students are experiencing less access at school after hours. The trend to larger centralized schools results in fewer community schools within easy reach after the buses leave for the day. This issue was further highlighted by educators during the November 2000 child poverty conference hosted by the major stakeholders in the Nova Scotia education system.

4 All school boards and the Community College should articulate a vision statement and long range plan for the integration of technology into the curriculum.

The Department of Education produced the document, *"Vision for the Integration of Information Technologies"* in 1999, however, not all school boards have articulated and published a vision and plan for the implementation of technology at the school board level. In the view of the committee, such a plan, developed with teacher expertise, is critical for the effective application of technology in the classrooms of Nova Scotia.

5 Teachers require access to appropriate, comprehensive, flexible, and ongoing professional development opportunities in the effective integration of technology.

" It is generally agreed in both the literature and by practitioners that the most important factor in the successful integration of technology into the curriculum is access to quality professional development opportunities for teachers.

The vast majority of teachers surveyed in the focus groups led by the committee reported that they had received some form of training on the basic operation of computer technology.

While basic training in the operation of technology is a necessary first step in preparation of teachers to use technology, the most important factor in the effective integration of technology into the curriculum is access to high quality professional development opportunities for teachers. This professional development is focused on classroom-based applications of technology to improve teaching and learning and must be rooted in sound pedagogy and focus on teaching and learning rather than on the technology itself. This type of PD requires expertise and experience in the classroom and must be rooted in the realities of the infrastructure and resources of Nova Scotia schools.

It is for these reasons that the Committee was troubled by the information received from teachers which indicate that a number of teachers have had no professional development in the integration of technology into the curriculum or that they had received "training" from vendors, non-educators, and private companies which focused on application training but not curriculum integration. This was particularly troubling in the case of some of the P-3 schools where, although access to technology was never indicated as a problem, there were serious flaws identified in the PD for the effective use of this expensive infrastructure. This mismatch clearly has resulted in a great deal of stress and a lack of self-confidence on the part of many teachers and lost opportunities at the classroom level.

Of the 292 principals responding to the committee survey, 39 identified on-site professional staff time dedicated to assisting teachers integrate technology into the classroom. The average amount of time for school based teacher professional staff in these schools was 0.4 Full Time Equivalent teaching positions.

Teachers generally reported that the best PD access was through the IEI project, which supplied some PD from both the school board and Department of Education level. Indeed, some teachers reported that IEI was the only PD opportunity they had ever received on integrating technology into the classroom.

In all focus group sessions, there was a consensus that the quantity of PD opportunities for curriculum integration of technology was woefully inadequate."

Technology Integration in Schools:
A Classroom Perspective, pg. 9

It is interesting to note that this is not a new problem or a new suggestion. The 1975 Report on the Federal Provincial Study of Educational Technology in Nova Scotia, *"Educational Technology Program for Nova Scotia"* states: "It is imperative that the planning of in-service sessions in educational technology begin as soon as possible to facilitate the proper integration of educational technology within the structure of the educational system of Nova Scotia." While the technology has most certainly changed in the 25 plus years since this report was written, the issue of quality professional development being critical to support effective teaching with technology has not changed nor been systematically addressed.

6 Developing and maintaining a technology-integrated school environment requires an increase in teacher preparation time.

The introduction of technology into the curriculum results in increased time demands on teachers for lesson preparation and administrative reporting.

Teachers identify such issues as the introduction of new equipment, software changes, development of technology-integrated lesson plans, increased use of computerized reporting, and minor computer and printer repairs and maintenance as contributing to the increase in the teacher work day. With Nova Scotia's classroom teachers averaging over 54 hours per week to do their job (as identified in the 2000 Dr. Andrew Harvey time use study, *"Life On and Off the Job"*), the intensification of teacher time becomes a concern for the ability of teachers to remain focused on their most important duty, the students.

7 Teachers own what they create and are entitled to the protection of Canadian Copyright Laws.

Unless prior written agreement is obtained, all materials created by an educator remain the sole property of the author.

8 In order to effectively integrate technology into the curriculum, every teacher requires access to a computer and an Internet connection both in the workplace and at home.

The capital cost, software, upgrades, Internet connection, and maintenance of technology is the primary responsibility of the employer.

9 Technology infrastructure (hardware, software, consumables, technical support, professional development) must be in place prior to implementation of technology initiatives in order to achieve the intended curriculum/information technology outcomes.

Teachers in the public school system and Community College faculty expressed concerns and frustration regarding the implementation of courses and curriculum when the technology was not in place or key components were missing. Appropriate professional development, hardware able to run the software, proper electrical and Internet connections, and basic consumable supplies must be in place if the intended outcomes are to be achieved.

10 Technology requires ongoing budget support for technicians, upgrading of hardware and software, and consumable supplies in order to be effective.

The capital acquisition of information technology equipment is often the only cost considered in the implementation of technology-integrated curricula. The reality, of course, is that it costs far more to maintain computer systems, keep software current, maintain Internet connection fees, and provide supplies, than to make the initial purchase of hardware.

Due largely to lack of funding in the school system, many necessary costs are minimized which results in unreliable technology, and frustration as teachers try to use under-supported and unreliable technology. At all the teacher focus groups conducted by the committee, teachers related stories of personal expenditure for paper, ink cartridges, and storage media to support an underfunded technology system at the school level. Indeed, some teachers reported equipment being unused due to lack of supplies. This underfunding has a very negative impact on the learning environment and the effectiveness of school programs.

11 Technology maintenance and network administration are primarily the responsibility of board/ school technicians and not teachers.

The number of certified repair technicians in Nova Scotia schools is woefully inadequate to meet the needs of the ever-expanding number of computers in the system. Many teachers voluntarily take on minor and sometimes major repairs at the school level in order to keep the school running or to reduce the long waiting times for technicians. This practice diverts qualified teachers from their primary role of teaching students.

While network administration is the primary responsibility of technicians, it must be noted that school networks exist to serve the needs of the school program. Flexibility in network design and administration is necessary in order to meet the unique requirements of teachers and students.

12 The Nova Scotia school system must be protected from inappropriate corporate intrusion resulting from pressure to place technology in schools.

The lack of funding in the public sector and the enormous costs of educational technology and support often gives rise to various corporate schemes to provide computers and other technology, Internet connections, software and indeed "high tech" schools for students, teachers and communities.

Nova Scotians must remain focused on the prime goal of the system, the development of a literate, compassionate, and free thinking society. This goal is best achieved through a publicly funded system with no corporate agenda or profit motives to affect the curriculum.

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ad hoc Committee on Technology

Resolution 99-54—REPORT

TECHNOLOGY INTEGRATION IN SCHOOLS

A CLASSROOM PERSPECTIVE

NSTU RESOLUTION 99-54 MANDATE

The Provincial Executive at the September, 1999 meeting assigned the mandate of Council Resolution 99-54 to the *ad hoc* Committee on Technology.

Resolution 99-54

BE IT RESOLVED that the NSTU establish a task force to study aspects of technology in schools including, but not limited to:

(a) the availability of technology in all schools;
(b) technical support staff available to schools;
(c) the possibility/feasibility of establishing Internet access to all teachers from their homes;
(d) Professional Support staff for schools

COMMITTEE STRUCTURE

ad hoc Committee on Technology

(Executive Motion, September 16, 1999)

Reginald Johnston, Chair	Cape Breton Local
Jim Boudreau	Executive Member
Bruce Abriel	Dartmouth Local
Linda MacIntyre	Lunenburg Local
Alan MacKinnon	Inverness Local
Earl Rutledge	NSTU Staff Liaison

ACKNOWLEDGEMENTS

The *ad hoc* Committee on Technology would like to acknowledge the contributions of a number of individuals whose contribution of time, energy, and commitment to improving Public Education made this report possible:

The local presidents and vice presidents of professional development for hosting a focus group and organizing the on-site logistics,

The school representatives for assisting with the principal survey and for conducting the School Representative Survey,

The principals for taking the time to complete and return the Administrator Survey,

The 168 teachers who gave up an evening, sometimes in bad weather, to attend a focus group and share their suggestions and concerns,

The teachers who assisted the school representatives in completing the personal technology use survey or mailed in a Teacher Survey.

EXECUTIVE SUMMARY

MANDATE AND RESEARCH DESIGN

The *ad hoc* Committee on Technology was given a mandate by the Provincial Executive in September, 1999 to conduct research of NSTU members in order to respond to Council Resolution 99-54 which asked for a study of the impact of technology in schools.

The Committee felt that it was important to collect both quantitative and qualitative data in order to respond to the mandate defined in Resolution 99-54. Each Local in the province was invited to host a focus group where a standard set of questions *(see Appendix 1)* were asked and answers recorded. Fifteen Locals held focus group sessions, which involved 168 members.

The Committee designed an Administrator Survey *(see Appendix 2)* to collect data at the school level. This survey was sent to all schools through the NSTU school representative mail and targeted to the school principal. This survey focused on curriculum support, technical support, and access to technology at the school level. The response to this survey was very positive with 292 schools reporting of the approximately 460 schools.

Once again using the NSTU school representative mail infrastructure, the Committee asked school representatives to poll staff as to personal access to computers and the Internet at home *(see Appendix 3)*. Two hundred and forty-three schools reported data on 4,123 teachers. This represents approximately 40% of public school teachers.

KEY FINDINGS AND THEMES

99-54a
Availability of Technology at the School Level

Student Access to Computers
Two hundred ninety-two schools responded to the principal survey, which represents a student population of 96,343. The ratio of students to computers for student use was 10:1 and 89:1 for administrative use. This ratio counts only current computers (< 5 years old). If all computers in the school are counted the ratios become 6:1 and 69:1 respectively.

When the current ratios are calculated removing the new construction schools from the count (all of which have approximately a 5:1 ratio), the current ratios for the remaining 243 schools (77,274 students) are 14:1 and 109:1

Supplies
In an era where education funding is generally inadequate to properly resource programs, it came as no surprise to the Committee that many classroom teachers reported a great deal of difficulty accessing appropriate classroom supplies for technology. The main issues were concerning paper, ink and toner for printers. The responses to this question varied widely within each focus group and indeed within schools in the same school board. Some teachers reported "no problem" while a neighboring school reported a great deal of difficulty accessing these supplies.

The main factors affecting the access to appropriate quantities of supplies seem to be related to the amount of technology in the school, the amount of fundraising and other user-pay schemes, and school priority for technology over other necessary supplies.

Software Support
Teacher responses to access to software ranged from excellent to none available. The teachers who reported the best access nearly all identified the IEI project as the source. Many teachers indicated obsolete hardware unable to run the curriculum software required for their programs as an issue. Several teachers suggested that lack of PD was an impediment to selecting good software and also in learning to effectively use the software they had.

99-54b
Technical Support for Classroom Teachers

Teachers were very vocal about this issue in most of the focus group sessions. The range of expertise, resolution time and repair reporting process varies widely with, in some cases, no clear understanding as to how to get a malfunctioning computer serviced. This leaves teachers very uneasy when it comes to planning lessons that depend on computers working on a given day. In fact, this lack of reliability is clearly a source of frustration and results in a lack of confidence by teachers in their ability to successfully integrate technology in their teaching.

Some boards have set up elaborate tech support infrastructures and, in these cases, teachers report a significantly shorter waiting time (one or two days). It appeared that the more geographically dispersed the board, the greater the time it took to get technicians to a school. Many teachers in P-3 schools reported that they did not have a technician or were in jeopardy of losing part or all the tech position they presently had. The range of repair expertise and use of volunteers from outside the school suggests that there may be issues of liability and confidentiality which need to be addressed.

In most sessions, teachers indicated that a fellow teacher, either on partial release time, or more often as a volunteer, was the first line of defense when a computer malfunctioned. However, teachers who do this support and volunteer work often indicated at focus group sessions that they were constantly interrupted while teaching to help other staff members. Many also indicated an increase in stress in trying to keep the ever-growing number of complex machines running in the school.

99-54c
Teacher Internet Access from Home

It became apparent during the focus group sessions that a large number of teachers had personal access to computers and Internet, which they currently fund with no support from the school boards or the province. A survey was sent to all NSTU school representatives in the province. Of the 4,123 teachers (243 schools) responding, 79% had a personal computer and 68% had a private Internet connection.

99-54d
Professional Support Staff for Schools

It is generally agreed in both the literature and by practitioners that the most important factor in the successful integration of technology into the curriculum is access to quality professional development opportunities for teachers. The Committee focused on three types of PD support for teachers: basic technology training, PD on curriculum integration, and training on system administration.

Basic training (basic operation of technology)

The vast majority of teachers reported that they had received some form of training on the basic operation of computer technology. A number did indicate that they needed a great deal more time, and some of the training received dated back to Fortran in the 1970's.

Professional Development for the Integration of Technology into the Curriculum

While basic training in the operation of technology is a necessary first step in preparation of teachers to use technology, the most important factor in the effective integration of technology into the curriculum is access to high quality professional development opportunities for teachers. This professional development is focused on classroom-based applications of technology to improve teaching and learning, and must be rooted in sound pedagogy and focus on teaching and learning rather than on the technology itself. This type of PD requires expertise and experience in the classroom and must be rooted in the realities of the infrastructure and resources of Nova Scotia schools.

It is for these reasons that the Committee was troubled by the information received in these studies which indicate that a number of teachers have had no professional development in the integration of technology into the curriculum, or that they had received "training" from vendors, non-educators, and private companies which focused on application training but not curriculum integration. This was particularly troubling in the case of some of the P-3 schools where, although access to technology was never indicated as a problem, there were serious flaws identified in the PD for the effective use of this expensive infrastructure. This mismatch clearly has resulted in a great deal of stress and a lack of self-confidence on the part of many teachers and lost opportunities at the classroom level.

Of the 292 principals responding to the Committee survey, only 39 identified on-site professional staff time dedicated to assisting teachers integrate technology into the classroom. The average amount of time for school based teacher professional staff in these schools was 0.4 FTE.

Teachers generally reported that the best PD access was through the IEI project, which supplied some PD from both the school board and Department of Education level. Indeed, some teachers reported that IEI was the only PD opportunity they had ever received on integrating technology into the classroom.

In all focus group sessions, there was a consensus that the quantity of PD opportunities for curriculum integration of technology was woefully inadequate.

Training on system administration of networks

In many larger schools the technology is networked and the Internet e-mail system is administered on site. With the exception of some P-3 schools, technicians are not on-site at the school. This lack of on-site support results in teachers either voluntarily, or on partial release time, administrating the school network to keep the school technology running day to day between visits from the board technician.

Teachers with responsibility for school networks or who have inherited this volunteer responsibility over time indicate a range of training from none to a variety of private, board-based or Department-based workshops in applications such as Novell, AppleShare, and School Vista. Many of these teachers began as a teacher looking after the one or two machines in the school on volunteer time. This job has grown to Sunday afternoons in the school maintaining a server and a large network of machines of varying age and complexity. Teachers with school network administration duties report a need for more training and a growing concern about their ability to meet the ever-increasing demands of the technology within the school while focusing on their primary role of teaching their students.

The issues raised at the focus groups by this question indicate an uneven and sometimes ill-supported infrastructure at the school level to keep the technology functioning.

TECHNOLOGICAL DEMANDS PLACED ON TEACHERS IN THE WORKPLACE

When asked to discuss any other issues or demands that technology integration placed on teachers, a very passionate discussion invariably took place in all focus groups. Teachers had a number of issues concerning time demands, curriculum and student learning, vision for the integration of technology, funding, real and self-imposed pressures in technology rich and poor schools, and, probably most often, equity of student access at home and at school.

To get the flavour of these important comments, the reader is directed to the full list beginning on page ten.

COMMUNITY COLLEGE TECHNOLOGY ISSUES

NSTU staff met with 29 members of the Community College Representative Council on April 27 to get a picture of the impact of technology on the Nova Scotia Community College system from a faculty perspective. Due to the nature of the curriculum at NSCC, it was noted that the majority of the faculty in the focus group had advanced skills in technology.

Student Access to Technology

Most faculty members indicated that access to technology was "ample" and "no problem". Some faculty reported as few as one computer in a classroom where CD-ROMs and technical manuals, or instructional software was needed in the classroom. Some faculty indicated that at the beginning of the year, lab access was not adequate.

Tech Support

The comments from the faculty indicated that the turnaround time for technology repairs was sometimes a function of the program (computer-related courses get priority) but that major repairs often happened the same day. In the case of less serious problems, wait times of a month were possible.

Concerns were expressed about the age and obsolescence of equipment, which was having an impact on the repairs, as the technicians are "snowed under."

Professional Development

A great deal of concern was expressed on the lack of time and effective professional development ensuring all technology in the College was being effectively used to advance the course objectives. Faculty comments are very similar to those made by colleagues in the P-12 system elsewhere in this report.

Vision for Use of Technology

There was a general criticism of the lack of leadership at the NSCC central office in the area of technology.

Curriculum Issues

The faculty identified the inability of the old equipment to run current curriculum software and CD-ROMs. There was a general consensus that the Internet access in the College was a tremendous resource.

Funding

Due to the nature of the Community College curriculum, a great deal of equipment and technology must be purchased and maintained in order to give students access to industry relevant learning experiences. The faculty expressed serious concerns that capital budgets are insufficient to allow for the upgrading and replacement of machinery and technology equipment in a timely fashion. This under-funding would have a negative impact on programs over time.

Personal Access

Community College faculty indicated a very high percent of personal ownership of technology and home Internet access. The issue of economic support by the employer to assist faculty was raised.

RESEARCH DESIGN

The Committee felt that it was important to collect both quantitative and qualitative data in order to respond to the mandate defined in Resolution 99-54.

FOCUS GROUPS

In order to get teacher perceptions of technology issues at the classroom level the Committee decided to conduct a series of focus groups. The NSTU local presidents and vice presidents of professional development were invited to host a focus group of teachers within the Local. The presidents were asked to organize a meeting with approximately 12-15 teachers representing a range of technology skill, grade level/subject area expertise, and years of teaching experience. *(see table below)*

The response from the Locals was extremely positive with 15 of 22 Locals inviting the Committee on Technology to conduct a session. A total of 14 focus group sessions were held between October 30, 2000 and April 27, 2001 which represented 15 public school Locals and the Community College faculty. *(see tables, right)*

Public School Locals	Date	# in Attendance
Cape Breton	Oct. 30, 2000	18
Northside-Victoria	Oct. 30, 2000	11
Lunenburg	Nov. 1, 2000	14
Halifax City	Nov. 8, 2000	11
Shelburne	Nov. 8, 2000	5
Inverness/Richmond	Nov. 20, 2000	12
Annapolis	Nov. 22, 2000	12
Halifax County	Jan. 9, 2001	9
Dartmouth	Jan. 16, 2001	14
Yarmouth	Jan. 31, 2001	12
Guysborough	Feb. 7, 2001	6
Colchester-East Hants	Feb. 19, 2001	7
Cumberland	Feb. 28, 2001	8
	Total	**139**

Community College	Date	# in Attendance
Community College Local	April 27, 2001	**29**

Public School Technology Focus Groups Participants by Teaching Experience and Gender

Years Teaching	Females	Males	No Gender Response	Totals	%
0 - 5	9	3	1	13	10%
6 - 11	12	13	2	27	20%
12 - 20	11	8	2	21	16%
21 – 35	20	40	13	73	54%
Totals	**52**	**64**	**18**	**134**	

A Teacher Survey Form *(see Appendix 1)* was designed by the Technology Committee to focus discussion and to keep the process as consistent as possible at each session. An NSTU staff member facilitated each session with the *ad hoc* Technology Committee members each assisting and observing at least one session.

The format was the same in all sessions: teachers identified by the Local received the Teacher Survey Form in advance of their focus group session, all questions were asked of the group, and all comments recorded on flip charts. The focus group sessions were all approximately 90 minutes in length and held in the evenings. The focus group for the Nova Scotia Community College Local was held with the Community College Representative Council.

Administrator Survey

The Committee on Technology designed an Administrator Survey *(see Appendix 2)* to collect data at the school level. This survey was sent to all schools through the NSTU school representative mail and targeted to the school principal. This survey focused on curriculum support, technical support, and access to technology at the school level. The response to this survey was very positive with 292 of the approximately 460 schools reporting.

School Representative Survey

Once again using the NSTU school representative mail infrastructure, the Committee asked school representatives to poll staff as to personal access to computers and the Internet at home *(see Appendix 3)*. Two hundred forty-three schools reported data on 4,123 teachers. This represents approximately 40% of public school teachers.

RESEARCH FINDINGS

99-54a
AVAILABILITY OF TECHNOLOGY AT THE SCHOOL LEVEL

In order to address the issue of availability of technology at the school level, the Committee collected information from teachers and administrators on hardware, Internet access, software, and supplies.

Computer Hardware

A written survey of school principals on technology had 292 responses. Using the data from these returns the following information was calculated:

Number of Computers

Computers assigned for:	**Number of Computers** *Any age*	**Number of Current Computers** *< 5 yrs. old*	**Number of Current Computers** *< 5 yrs. old—**Excluding new construction***
	292 schools 96,343 students	292 schools 96,343 students	243 schools 77,274 students
Student Use	15,537	9,931	5,672
Admin. Use	1,392	1,086	708

Student—CPU Ratios

Computers assigned to:	**Ratio—Students Per CPU** *(Any age)*	**Ratio—Students Per Current CPU** *(< 5 yrs. old)*	**Ratio—Students Per Current CPU** *(< 5 yrs. old) **Excluding new construction***
	292 schools 96,343 students	292 schools 96,343 students	243 schools 77,274 students
Student Use	6:1	10:1	14:1
Admin. Use	69:1	89:1	109:1

Supplies

In an era in which education funding is generally inadequate to properly resource programs, it came as no surprise to the Committee that many classroom teachers reported a great deal of difficulty accessing appropriate classroom supplies for technology. The main issues were concerning paper, ink and toner for printers. The responses to this question varied widely within each focus group and, indeed, within schools in the same school board. Some teachers reported "no problem" while a neighbouring school reported a great deal of difficulty accessing these supplies.

The main factors affecting the access to appropriate quantities of supplies seem to be related to the amount of technology in the school, the amount of fundraising and other user-pay schemes, and school priority for technology over other necessary supplies. Several teachers reporting shortages of technology supplies indicated that this shortage was because other necessary items had to be purchased, while others reported that purchasing technology supplies caused hardship in other areas of school spending.

Most teachers, including those that reported no problem, expressed concern for the future. The following quotes are included to give a sense of the range of responses to this often emotional and frustrating issue:

- it is bankrupting our school
- no printers—so no problem
- generally not a problem
- teachers buy ink for class with personal money
- bought CD with my own money
- ½ of our printers are in storage—no ink (P-3)
- it would cost $10,000 to replace all the ink cartridges in our school (P-3)
- printing costs are higher in a technology rich school
- works with careful limits

- primary CDs are old + scratched and no money to replace
- Home and School fund supplies
- parents fundraise
- pop machine funds ink and paper
- 6 months without ink on my IEI printers
- cafeteria fund buys supplies
- 2 cartridges per year per class
- charge students per copy ($.05 - $.20/page)
- ink is "hidden away"
- replacing mice and balls a problem
- pretty well supplied
- great support from administration
- student fee
- grant writing
- private donations

Software Support

Teacher responses to access to software ranged from excellent to none available. The teachers who reported the best access nearly all identified the IEI project as the source. Many teachers indicated obsolete hardware being unable to run the curriculum software they needed for their programs as an issue. Several teachers suggested that lack of PD was an impediment to selecting good software and also in learning to effectively use the software they had. A representative sampling of teacher responses follows:

- huge expense to purchase and update virus and utility software
- can get necessary software
- can't afford to buy enough legal copies
- we use Scholastic book order coupons to buy our software
- donations
- fundraising
- assistive technology software supplied by board
- booklist
- software supplied but no PD
- not enough for current CD-ROM learning activities
- excellent software budget
- IEI software excellent
- school uses supplementary funding to buy software
- PTA buys hardware and software
- computer capacity a problem
- E-grade working for administration but not for teacher – costing extra teacher time
- not enough listed at the book bureau
- nothing available beyond IEI
- need generic software bundle in all schools – Dept. or board supplied
- we only have "game" software
- well supplied (Home and School)
- P-6 School Vista plenty – gaps in grades 7 and 8
- special education software not teacher selected and not appropriate (P-3)
- all classroom budgets used for other basic materials

99-54b
TECHNICAL SUPPORT FOR CLASSROOM TEACHERS

Teachers were very vocal about this issue in most of the focus group sessions. As the following sampling of quotes indicate, the range of expertise, resolution time and repair reporting process varies widely with, in some cases, no clear understanding as to how to get a malfunctioning computer serviced. This leaves teachers very uneasy when it comes to planning lessons that depend on computers working on a given day. In fact, this lack of reliability is clearly a source of frustration and results in a lack of confidence by teachers in their ability to successfully integrate technology in their teaching.

Some boards have set up elaborate tech support infrastructures and, in these cases, teachers report a significantly shorter waiting time (one or two days). It appeared that the more geographically dispersed the board, the greater the time it took to get technicians to a school. Many teachers in P-3 schools reported that they did not have a technician or were in jeopardy of losing part or all the tech position they presently had. The range of repair expertise and use of volunteers from outside the school suggests that there may be issues of liability and confidentiality which need to be addressed.

In most sessions, teachers indicated that a fellow teacher, either on partial release time, or more often as a volunteer, was the first line of defense when a computer malfunctioned. However, teachers who do this support and volunteer work often indicated at focus group sessions that they were constantly interrupted while teaching to help other staff members. Many also indicated an increase in stress in trying to keep the ever-growing number of complex machines running in the school.

A sampling of teacher comments on tech support at the classroom level:

Repair Process and Procedure

- understaffed – tech support from school board
- some teachers given some release time to do repairs

- teacher volunteer
- very poor response – lack of staff
- none
- 1 technician for 2 counties
- sometimes as long as 6 month wait!
- school funded private repair
- our principal repairs machines
- board technician 1 day to 1 week
- library tech takes care of 100 computers
- due to lack of tech staff simple repairs get ignored
- high school students repair elementary school computers
- self-taught EPA does simple repairs
- teacher, then CRS teacher, then board technician (3 week average)
- we have no machines so tech support is not a problem!
- fix it myself
- board help desk – server same day
- teacher volunteer after school and weekends
- hire private consultant (teacher pays)
- junior/senior high seem to get priority over elementary schools
- technicians seem very busy!
- sometimes same day
- parents come in and volunteer
- I can't get a light bulb for my overhead so you can imagine...

Tech Support Issues

- technology must be seen as a pencil with constantly breaking lead
- lack of stability of hardware causes stress
- labs not working when booked
- new IEI machines not always reliable
- technology operating system conflicts between School Vista and curriculum software causing frequent crashes
- technical problems - limited printing modules difficult to develop with this infrastructure
- P-3 frequent lockups (not School Vista) technicians unable to resolve
- Knowledge House ghosting erases all added software
- Timbuktu—promised us training but technical problems mean it does not work
- software will not run—(Avid Cinema) can't get into it
- staff have no access rights to server
- mixed platform & age of CPU
- nothing consistent
- repairing CPU at home
- never catching up to repairs and fixes
- need technician on site in lab
- more teacher stress (how many machines will work today?)
- interruptions in teaching to do troubleshooting

99-54c
TEACHER INTERNET ACCESS FROM HOME

It became apparent during the focus group sessions that a large number of teachers had personal access to computers and Internet which they currently fund with no support from the school boards or the province. In order to get a more accurate picture of private ownership of technology by teachers, a survey was sent to all NSTU school representatives in the province. 243 schools responded and the following data emerged:

# of Teachers	Home PC's	%	Internet access	%
4123	3268	79	2816	68

Comments made during the teacher focus sessions make the point that teachers feel they should be subsidized in some way for the work-related expenses they incur to enable them to do their work and integrate technology into teaching and curriculum.

- I work at home on my machine and my research helps me
- we need cost-shared Internet connections at home
- most of my time is spent at home on the 'Net and this cost is not subsidized
- priorities (car or computer)

The *ad hoc* Committee on Technology has had preliminary discussions with the Teachers Credit Union and private vendors on teacher purchase plans for technology and Internet access, and will, as part of its mandate, continue to explore this issue in the 2001-2002 school year.

99-54d
PROFESSIONAL SUPPORT STAFF FOR SCHOOLS

It is generally agreed in both the literature and by practitioners that the most important factor in the successful integration of technology into the curriculum is access to quality professional development opportunities for teachers. The Committee focused on three types of PD support for teachers: basic technology training, PD on curriculum integration, and training on system administration.

Basic training (basic operation of technology)

The vast majority of teachers reported that they had received some form of training on the basic operation of computer technology. A number did indicate that they needed a great deal more time and some of the training received dated back to Fortran in the 1970's. The source of this basic training, as one would expect, is varied in provider, location and time of delivery. The provider of basic training sessions identified included:

- self-taught
- university courses
- adult education courses
- school inservices
- teacher mentors
- teacher centres
- summer institutes
- community college courses
- private tutors/companies
- family members
- school board and Department of Ed. inservices

Professional Development for the Integration of Technology into the Curriculum

While basic training in the operation of technology is a necessary first step in preparation of teachers to use technology, the most important factor in the effective integration of technology into the curriculum is access to high quality professional development opportunities for teachers. This professional development is focused on classroom-based applications of technology to improve teaching and learning, and must be rooted in sound pedagogy and focus on teaching and learning rather than on the technology itself. This type of PD requires expertise and experience in the classroom and must be rooted in the realities of the infrastructure and resources of Nova Scotia schools.

It is for these reasons that the Committee was troubled by the information received in these studies which indicate that a number of teachers have had no professional development in the integration of technology into the curriculum, or that they had received "training" from vendors, non-educators, and private companies which focused on application training but not curriculum integration. This was particularly troubling in the case of some of the P-3 schools where, although access to technology was never indicated as a problem, there were serious flaws identified in the PD for the effective use of this expensive infrastructure. This mismatch clearly has resulted in a great deal of stress and a lack of self-confidence on the part of many teachers and lost opportunities at the classroom level.

Of the 292 principals responding to the Committee survey, only 39 identified on-site professional staff time dedicated to assisting teachers integrate technology into the classroom. The average amount of time for school-based teacher professional staff in these schools was 0.4 FTE.

Teachers generally reported that the best PD access was through the IEI project, which supplied some PD from both the school board and Department of Education level. Indeed, some teachers reported that IEI was the only PD opportunity they had ever received on integrating technology into the classroom.

In all focus group sessions, there was a consensus that the quantity of PD opportunities for curriculum integration of technology was woefully inadequate.

Professional Development Issues

- need more support on integrating technology (PD)
- teachers keen to learn technology
- PD opportunities by board being replaced by Intel program with unrealistic time commitments
- personal pressure to learn and use technology with students—personal inadequacy to do best for students
- inservicing—not even approaching needs—more instruction needed for beginners as well as others
- ½ day inservicing overwhelming
- still struggle to get on top of it (PD issues) not enough time & PD
- not enough PD and inequities in PD due to release time issues
- tech committee at school helps
- IEI mentor expected to train but no time allotted
- Tech Ed Program—old CPU, limited program and software available
- Tech Ed—CNS, Robotics, + computers—PD issue
- P-3 staff received no training or PD
- need PD specific to my teaching and my level
- no one for a teacher to ask for help
- teachers are trying to help each other
- good support is helping
- lack of sustained support
- PD for curriculum integration

- school-based technology coordinator needed
- more sophisticated software longer to learn
- staff changes—expertise lost
- need more access to teaching sharing tech software techniques, curriculum integration
- lifelong learning
- has been the best that has ever happened to my teaching—I need more PD
- lack of PD & hardware support means only low level use of technology can occur
- need more PD/experience in designing lessons in station-based instruction
- platform changes within schools causes stress/software/hardware

Sources of professional development support

- none
- very limited
- many teachers are self-taught
- peer to peer
- we rely on school-based expertise
- teachers help each other after school
- school-based inservices
- teacher centre
- university courses
- P-3 consortia
- P-3 funded board delivered
- school board inservices/summer institutes
- IEI inservices
- university summer institutes/conferences
- NSELC
- Department summer institutes
- weekend course (vendor)
- Future Kids
- adult ed classes
- B.Ed. prep
- special association conferences
- colleagues
- extensive by IBM (School Vista)
- little and weak (not practical)
- self-taught using Internet forums

Training on system administration of networks

In many larger schools the technology is networked and the Internet e-mail system is administered on-site. With the exception of some P-3 schools, technicians are not on-site at the school. This lack of on-site support results in teachers either voluntarily, or on partial release time, administrating the school network to keep the school technology running day to day between visits from the board technician.

Teachers with responsibility for school networks, or who have inherited this volunteer responsibility over time, indicate a range of training from none to a variety of private or board/Department based workshops in applications such as Novell, AppleShare, and School Vista. Many of these teachers began as a teacher looking after the one or two machines in the school on volunteer time. This job has grown to Sunday afternoons in the school maintaining a server and a large network of machines of varying age and complexity. Teachers with school network administration duties report that more training is needed, and a growing concern about the ability to meet the ever-increasing demands of the technology within the school while focusing on their primary role of teaching their students.

The issues raised at the focus groups by this question indicate an uneven and sometimes ill-supported infrastructure at the school level to keep the technology functioning.

TECHNOLOGICAL DEMANDS PLACED ON TEACHERS IN THE WORKPLACE

Teachers were asked at the focus group sessions to identify any other changes in their work life in relation to technology. The following non-prioritized compilation of teacher comments made at these sessions is divided into the major themes, which emerged. The range of issues and opinions expressed indicate the tremendous impact the introduction of technology into schools is having on the culture and climate of our schools. The Committee was struck by the similarity of opinions and issues in every Local and school board.

Vision for Technology Integration

- kids first
- want to ensure tech is beneficial to my students
- what is the vision for the future after IEI
- no technology planning at the Board level
  - hardware
  - technical
  - PD
  - funding
- demands high but interesting
- I'd be lost without my computer
- love the demands
- no demand at all, no vision for use, only buy cartridges and hardware

- this process is evolving and will continue to grow
- no pressure to use tech.
- varying levels of interest in technology at the school level—few teachers carrying load
- trying to find ways to help teachers integrate tech (admin. support)
- over time technology will save us time
- trying to reach to push limits
- more tech attention should be given to students with learning disabilities (Jr. & Sr. High)

Time and Change Issues

- stress/fear of the change—this is changing/more relaxed
- too much chop & change
- drastic change in last 3 yrs.
- swamped with technology
- drowning in my own soup now that the tech has become so common
- time demands on teachers due to computers unbelievable
- prep lessons to use tech with 32 students & 4 computers + other related activities is difficult
- lesson planning much longer to prepare
- tech takes time away from other planning
- being pressured for time due to content for APEF
- time poor
- want to do more but need prep time
- rapid pace has "bitten into my life"
- would like to do more but time is an issue
- difficult to find time for planning
- demands extraordinary—relentless request for support
- where do I get the time to develop my Web site
- limited time—so much to do
- personal time & energy
- any technology questionnaires arrive on "my" desk
- more stress getting PSA's trained
- IEI and community access adds more work for staff
- time to get students access codes—no release time
- tech on top of my teaching
- sense of frustration trying to do it all
- e-mail and voice-mail driven
- large amount of time invested in learning new technology—more hours—but fun P-3
- lot of extra work as school Web master
- demands of all new curriculum and tech
- less prep time in school
- extra work load—take time from prep
- extra work for school—communications placed on classroom teachers
- as teacher volunteer, self-imposed pressure to keep machines working
- teachers time to install software and do administration of CPU is time-consuming
- computers offer a richer resource to students. Helps me as teacher, but I need to know content, software, hardware—at the same time—much more complex and demanding, very stressful

Pressure

- I am made to feel that I should be integrating tech in my classroom, but I don't have opportunity to learn it and not the infrastructure to teach it
- teachers feel pressure to show integration of tech but it is not supported at the classroom level
- IEI—"use them or lose them" at the school level staff pressure
- teacher pressure on how to use tech in their program
- leaders become victims of success
- community demands very high
- as a "have not" the expectations coming are very stressful
- demand is from students and parents (P-3)
- teachers are victims of success—expectations raising
- trying to motivate teacher
- subtle pressure to buy into the technology revolution or be labelled a dinosaur
- P-3 pressure—parents, personal, administration
- obsolete equipment—demands by parents & students
- parents under pressure from children
- parent technology backlash (too much technology P-3)
- I feel it is a tool but feel pressure because we are P-3—excellent
- some teachers feel no stress as they don't use it
- good—stress—time to organize and properly prepare
- K-12 Planet
    - parents pressure me to use it
    - marks
    - attendance
    - homework, etc

- frustration with teachers not interested
- only use my IEI machines 50% of time
- teachers are being forced to use the computers to do marks and admin and this stresses some staff and imposes some inefficiencies on staff (computer is slow or down, I don't type fast enough)—in a large school the tech is too old to handle load
- I do my marks and like it

Curriculum

- does APEF exams reflect tech integration
- feel pressure to complete course content and outcomes but tech information takes more time
- I spend as much time teaching about the computer as my subject
- students see technology as focus not curriculum
- students expect computers to be entertainment
- software more complex
- no rubric for evaluating student use of technology (PD)
- spend as much as 3 nights/week after school helping students with technology
- keyboarding needed at earlier level
- does P-3 work?
- tech is not yet user friendly enough for curriculum
- finding time within curriculum for computer work
- new curriculum keeps teachers busy but technology adds another good but extra time demand
- can't keep up with curriculum changes driven by technology
- rate of curriculum change—no software to match
- lack of proper software in French immersion
- in groups–5 watching and 1 using computer does not work–not worth the hassle
- tech ed software (AutoCAD) much more complex and requires more direct supervision and directed learning
- in elementary and secondary lab is best—too much time to prepare in learning styles manner—should revisit this idea
- always need a back-up plan because I can't rely on it
- I use the Internet for enrichment
- only a frill because I can't rely on them for my curriculum
- nothing worse when using broken equipment
- hardware and software not ready when course due to start (high school) and no info on when it will be ready
- some schools are better equipped, but this does not necessarily mean better learning
- want lab approach rather than classroom machines
- laptop to take home has been a revolution
- computers offer a richer resource to students. Helps me as teacher, but I need to know content, software, hardware—at the same time—much more complex and demanding, very stressful
- not all students are motivated by technology, maybe a separate course is the way to go
- demands by fellow staff to solve technical problems stressful—takes from my prep.
- frustrated not to have control of my Web page

Student Supervision

- student plagiarism
- supervision of students on Internet is a problem
- Internet security is an issue – teachers are responsible for all sites visited by students
- worry about inappropriate Internet use and time to monitor
- supervision outside regular hrs.—high personal expectation
- limited access in classroom with large classes makes class management difficult
- works best with small classes or groups

School Administration Software

- admin software stressful – PD needed
- admin software Windsor, E Grade coming too fast with no support—these cause deadline problems and result in stress
- helping teacher with report cards
- School Admin. Software adding more learning time and access issues
- computerized report cards adding more work/time to learn

Equity Issues

Home

- equity of access to students causing academic gap to increase
- students from homes without technology are worried about impact on marks
- "have" students and "have not" students—have access at home—equity issue
- educating parents (equity issues)
- inequality—students with home machines especially true with K-12 Planet

- socioeconomic equity issues
- CAP sites can help in some areas

School

- as a teacher, not to be able to give my students access is very frustrating
- no access at my present school—what is the point!
- lack of access for students on limited hardware
- 1 old machine in my classroom—it is impossible to integrate
- 1:45 ratio upsets students
- 32 kids—3 computers
- could use technology in my program (Family Studies)—equity issue
- have and have not schools—equity
- no access to any technology
- school based resources need to level playing field
- elementary lack of hardware, software, PD & facilities (A.C. power & Internet)
- best machine in CAP or office/recycled in classrooms
- recycled machines a headache

Funding

- all fund raising goes towards computers—other things suffer
- all Home & School fundraising for technology—can't keep up
- what happens after IEI
- building infrastructure
- time and energy for fundraising particularly elem. level
- financial demand on teachers for:
  - personal CPU
  - PD courses
  - classroom supplies
- reducing paper
- refresh a concern
- stress to raise money to keep up on hardware/technician

COMMUNITY COLLEGE TECHNOLOGY ISSUES

NSTU staff met with 29 members of the Community College Representative Council on April 27 to get a picture of the impact of technology on the Nova Scotia Community College system from a faculty perspective. Due to the nature of the curriculum at NSCC, it was noted that the majority of the faculty in the focus group had advanced skills in technology. The following quotes are sorted by themes and are not in a priority order.

Student Access to Technology

Most faculty members indicated that access to technology was "ample" and "no problem". Some faculty reported as few as one computer in a classroom where CD-ROMs and technical manuals, or instructional software was needed in the classroom. Some faculty indicated that at the beginning of the year lab access was not adequate.

Tech Support

The following comments from faculty describe the process and turnaround time for technical repair

- same day/one day (major)
- minor—can be months (some major)
- long term fixes take longer to get
- seems to depend on program (computer-related courses get priority)
- capital expenditures on aging equipment is insufficient and unplanned
- technicians are "snowed under"
- server infrastructure not keeping up
- DOS!!!
- have it but no tech support to install

Professional Development

A great deal of concern was expressed on the lack of time and effective professional development to ensure that all technology in the College was being effectively used to advance the course objectives. Faculty comments are very similar to those made by colleagues in the P-12 system elsewhere in this report.

- support up to intermediate stage good—after that none
- expectation that you learn it as you teach
- no integration taught
- we help each other
- we do not do enough within the learning resource centre

- very knowledgable faculty that could be of help to public school teachers (member to member)
- we don't take advantage of partnerships with tech community

Vision for Use of Technology

- leadership in it at Central Office is terrible
- college spam (official and unofficial)
- lack of consistent clear policy on inappropriate use of Internet

Curriculum Issues

- no multimedia
- no CD drives
- software outside site licenses almost impossible
- Microsoft updates licenses current
- tremendous resource on our desks through the 'Net —that is a good thing
- wasted student time due to Internet surfing and chat

Funding

Due to the nature of the Community College curriculum, a great deal of equipment and technology must be purchased and maintained in order to give students access to industry relevant learning experiences. The faculty expressed serious concerns that capital budgets are insufficient to allow the upgrading and replacement of machinery and technology equipment in a timely fashion. This under-funding would ultimately have a negative impact on programs over time.

- only bare minimum low or no capital
- no budget for proper tech
- student equipment and software is sometimes more advanced than campus
- poor economic considerations for faculty

Personal Access

Community College faculty indicated a very high percent of personal ownership of technology and home Internet access. The issue of economic support by the employer to assist faculty was raised.

- 22 private access to computers
- 20 private Internet accounts
- attempts to get reduced pricing for faculty

APPENDIX 1

NSTU Technology Survey
— Teacher Survey —

Grade Level(s) Taught_____ Subject(s) Taught_____

Teaching Experience: ☐ 0-5 yrs. ☐ 6-11yrs. ☐ 12-20 yrs. ☐ 21-35 yrs.

Gender: ☐ Male ☐ Female

A Access

1) Which of the following best describes your computer skill level?
☐ Novice ☐ Intermediate ☐ Advanced

2) Describe the classroom access to computers for your students.

_____

3) Describe the access to computers in a lab environment for your students.

_____

4) What internet access is available **in school**
a) to you for preparation?_____

_____

b) to your students?_____

_____

5) Do you have off-site access to:

	Yes	No	
a)	☐	☐	a computer?
b)	☐	☐	internet?

B Professional & Curriculum Support

6) a) Have you received technology training (basic operation)?

_____

b) Have you received professional development for the integration of technology into the curriculum?

_____

c) Have you received technology training (basic system administration of networks)?

_____

C Support Issues

7) Describe the technology support available to you in the following areas:
a) technical _____
b) supplies at the classroom level _____
c) curriculum support _____
d) administrative support _____

8) Describe the technological demands placed on you in the workplace. *(over)*

(Please use other side for any additional comments)

APPENDIX 2

NSTU Technology Survey
— Administrator Survey —

School _____ Board _____ Principal _____
Grade Levels: _____ Student enrolment _____

Number of teachers (Full Time Equivalent - FTE)

A Technical and Curriculum Support *(please fill in the number of FTE)*

1) _____ (FTE) Scheduled **school**-based teacher time for supporting teachers with the curricular integration of technology
2) _____ (FTE) Scheduled **school**-based teacher time for tech support/ trouble shooting:
3) _____ (FTE) **School**-based technician (non-NSTU)

4) _____ (FTE) Scheduled **board**-based teacher staff time for supporting teachers with the curricular integration of technology
5 a)_____ (FTE) Scheduled **board**-based technician (non-NSTU) assigned to school
Board-based technician Work Order based ☐ Yes ☐ No
b)_____ (Days) Response time for Work Order process (typical time to arrive on site from time of call)

B Availability

6) How many computers, are **actively** in use in the school for student use?
a)_____ Older technology (greater than 5 years old)
b)_____ Recent technology (Pentium or PowerMac - less than 5 years old)

7) How many computers, are **actively** in use in the school for administrative use?
a)_____ Older technology (greater than 5 years old)
b)_____ Recent technology (Pentium or PowerMac - less than 5 years old)

Peripherals (actively in use)

8) Printers (actively in use, any type)
Student Use
a)(1-5) ☐ b)(5-10) ☐ c)(10-20) ☐ d)(>20) ☐
e)_____Office Use f)_____Teacher Use

9) Data Projectors
a)_____ Overhead style (LCD panel)
b)_____ LCD Data Projectors
c)_____ Smart boards

10) a) _____ Other Scanners (in use)
b) _____ Digital still cameras
c) _____ Camcorders
d) _____ Graphing calculators
e) _____ Math and Science probeware

	YES	NO	
11)	☐	☐	Do you have assistive technology equipment for students with special needs?

C In The Future

	YES	NO	
12)	☐	☐	Has your school been built or renovated within the last 5 years?
13)	☐	☐	Is your school population expected to become part of a new school complex within the next 2 years?

to complete this form electronically: http://www.nstu.ns.ca/technology

APPENDIX 3

Nova Scotia Teachers Union

MEMORANDUM

TO: School Reps

FROM: Earl Rutledge, Co-ordinator – Educational Technologies
Reg Johnston, *ad hoc* Technology Committee Chair

DATE: February 12, 2001

RE: NSTU Technology Survey

The NSTU through an *ad hoc* committee on technology is in the process of developing a report for Council 2001 on the Impact of Technology in N.S. Public Schools.

The committee is in the process of conducting focus group sessions across the province to get teacher input on issues of access, professional development and curriculum support, and technology support.

As part of this information gathering process, the committee is asking for the assistance of school reps in describing teacher access to technology and internet at home at personal expense. Please poll your staff and complete the following survey.

School _____

Number of teachers _____

Number of teachers with personal home computer _____

Number of teachers with personal home internet accounts _____

Please return this sheet by March 9th in the envelope provided.

Thank you for your assistance.

ER/gpd

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