

Evaluation of the Manitoba Schools Computer Network¹

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In December, 1973, an evaluation committee was organized to evaluate the Manitoba Schools Computer Network. The evaluation centered on the use of the computer in teaching computer courses in the schools. Attention was focused on those schools having direct access to a computer terminal.

It was found that the computer network was favorably received by both teachers and students. Even those students who did not have direct involvement with the computer terminal in their school were aware of its existence. Those students who were taking computer courses became highly involved, and spent considerable time on course assignments and on projects of their own. Teachers appeared well satisfied with the help they received from the Computer Services Branch and with the functioning of the network.

EVALUATION PROCEDURES

The evaluation committee determined that its major focus would be on the first objective of the Manitoba Schools Computer Network, namely, the use of the computer in teaching Computer Science 205 and 305, and Data Processing 202 and 302.

Questionnaires were designed to gather information from students who were taking computer science or data processing courses, from teachers of those courses, and from students who were not taking computer courses.

The computer science or data processing teacher was asked to have his students fill in the student questionnaire and attitudes checklist; to complete the teacher questionnaire; and to obtain responses to the student questionnaire from a class which contained few, if any, students enrolled in a computer course.

COMPUTER SCIENCE AND DATA PROCESSING STUDENTS

A total of 894 students completed and returned the questionnaire. Table 1 indicates the grade distribution of those who responded.

¹The material contained in this report came from the "Report on the Evaluation of Manitoba Schools Computer Network," written by Dr. Heather Sharman (chairman of the mathematics dept. at Gordon Bell High School in Winnipeg), published in April 1974 by the Computer Services Branch.

TABLE 1

STUDENT ENROLLMENT IN COMPUTER COURSES BY GRADE LEVEL

Course	Grade Level			Total
	X	XI	XII	
Computer Science 205	17	372	88	477
Computer Science 305	6	12	131	149
Data Processing 202	2	96	112	210
Data Processing 302	0	1	30	31
Total	25	481	361	867

Of these students, the majority (76%) were enrolled in a high school program, and 24% of the students were enrolled in a business education, vocational, or occupational entrance program.

Students were asked if they planned to take a further computer course at some future time. A total of 61% of the students said they would, 30% were undecided, and 9% said they would not. For those who said they would not, comments focussed on the difficulty and the time-consuming nature of computer courses.

FIGURE 1

Type of program in which the students who responded were enrolled.

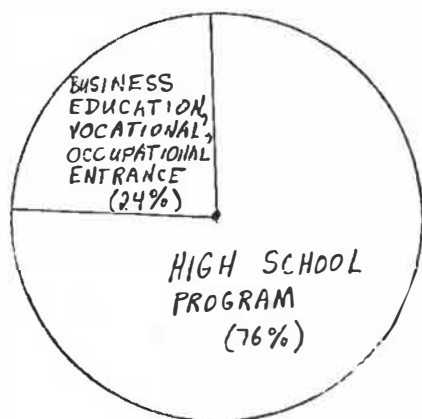
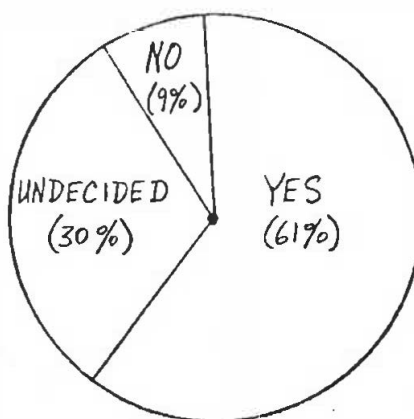


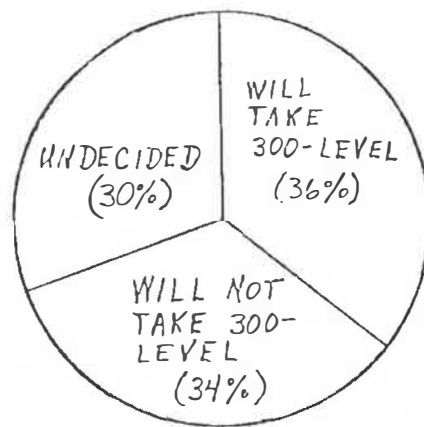
FIGURE 2

Student response to the question, "Will you take another computer course in the future if provided with the opportunity?"



In spite of the large number of students indicating interest in another computer course at some time, a question directed to students who were enrolled in the 200-level courses indicated that only 36% of these students intended to take the corresponding 300-level course, with 34% of the students stating that they would not, and 30% of the students undecided. Here, one of the major problems for students appeared to be the fact that the computer courses may not be acceptable to the university they wish to enter.

FIGURE 3
200-level students' responses to the question, "Will you take the corresponding 300-level course?"



The time-consuming nature of the computer courses is further illustrated by students' responses to questions about the amount of time spent on computer course assignments and on computer projects of their own. While the majority of students appeared to be spending an amount of time on computer courses in keeping with the time spent on all courses, 33 students reported having spent more than 10 hours a week on assignments, and 18 students reported having spent more than 10 hours a week beyond the time required by the assigned work in the course.

TABLE 2
NUMBER OF STUDENTS SPENDING A GIVEN NUMBER OF
OUT-OF-CLASS HOURS PER WEEK ON COURSE WORK

Time Spend On: (hours)	All Courses	Computer Course Assignments	Students' Own Computer Projects
Less than 1	86	169	335
1-3	165	313	309
3-5	231	204	123
5-7	143	100	49
7-9	110	45	22
10 or more	135	33	18

A separation of the responses according to whether or not there was a computer terminal present in the student's school showed that while there was no difference in the amount of time students spent on all courses, there was a significant difference in the amount of time spent on computer science courses. Of the students in schools with terminals, 10.4% reported, and of the students in schools without terminals, 3.6% reported that they spent 7 or more hours per week on computer course assignments. Similarly, 12.2% of the students in schools with terminals and 3.0% of the students in schools without terminals reported spending 5 or more hours on computer activities other than assignments. It seems clear that where there was ready access to the computer, some students spent a disproportionately large amount of time on computer-related activities. Those schools with terminals were able to provide their students with the opportunity to develop in either a formal or an informal fashion an interest beyond the standard academic program.

Students in the computer courses were asked whether they thought that all students should have some form of exposure to computers. The majority (68%) answered "yes" with a number of comments on the increasing impact of the computer on our everyday lives. The 11% of the students who answered "no" gave as reasons the lack of ability or interest of some students and the need to leave the choice up to the individual student.

A set of questions regarding the functioning of the network - file storage, usefulness of error messages, turn-around time, availability of materials, facilities - showed that, in general, students have a positive view of most aspects of the network. The only negative perception that appeared was in response to an item regarding the availability of a keypunch. Of the respondents, 43% agreed with a statement that a keypunch was usually available when needed, and 57% of the students disagreed with the statement. Responses to questionnaire items regarding texts seemed to indicate that no text was being extensively used by the students.

FIGURE 4
Response to the question,
"Should all students have
some form of exposure to
computers?"

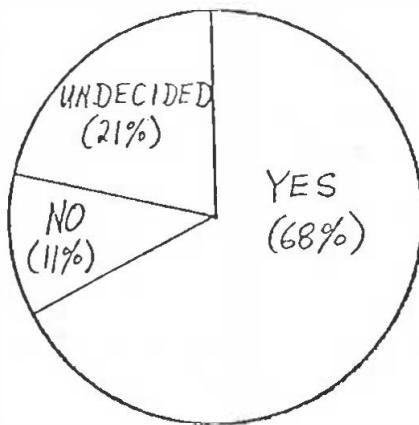
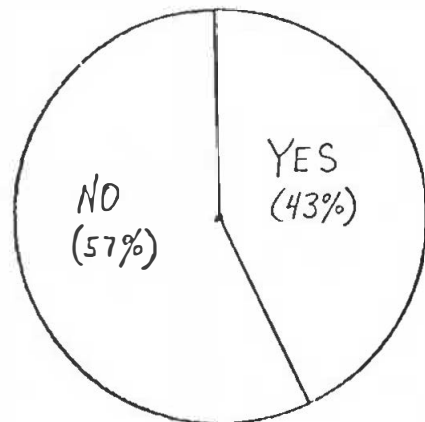


FIGURE 5
Response to the question,
"A key punch is generally
available when needed."



COMPUTER SCIENCE AND DATA PROCESSING TEACHERS

A total of 43 teachers of computer courses completed and returned this questionnaire in which most of the items dealt with the functioning of the network itself. Teaching a computer course in the Manitoba schools is a relatively new concept, and only 10 of the 43 teachers had more than one year's experience in these courses; the average experience prior to the 1973-74 school year was 1.07 years.

Like their students, these teachers appeared to have a positive feeling toward the services available to them - error messages, network library, permanent file space, amount of time the terminal is available, promptness of repairs, the increased number of runs per day possible now that the network is in operation. They also found both the newsletter *Computer News* (39 of 40 respondents) and *Information Release* (41 of 41 respondents) useful and responded positively to statements about consultant services and in-service programs; 36 of 43 respondents found the consultants' response time to questions satisfactory; 31 of 42 respondents found that the in-service programs met the needs of the users.

Questionnaire items regarding their local situations showed somewhat less favorable responses. While 32 of 38 respondents felt that their students had sufficient time on the terminal, 31 of these 32 teachers worked in schools where a terminal was located; only one teacher in a school not having a terminal felt that his students had sufficient time.

TABLE 3
 RESPONSES TO THE QUESTION: "DO YOUR STUDENTS HAVE
 SUFFICIENT TIME ON THE TERMINAL?"

	Sufficient Time	Insufficient Time	Total
School has terminal	31	2	33
School has no terminal	1	4	5
Total	32	6	38

The question of sufficient student time on the keypunch showed a more even split. Of 42 teachers, 22 stated that their students had sufficient time, and of 39 teachers, 21 stated that when they needed a keypunch one was usually available. However, over half (428 of 746) of the students who replied to the same question stated that they did not find that a keypunch was usually available when they needed one.

Almost all the teachers who responded (42 of 43) felt that students, teachers, and administrators should be provided with some exposure to the computer.

Items dealing with supervision of the terminal and with assistance given to students using the terminal showed that most of the computer science and data processing teachers (34 of 38 who responded) were using their own free time for this purpose; only 2 teachers reported that they got compensatory time. Teachers were also using their free time where there were short exposure courses being given to students and other teachers, where computer clubs had been formed, and where there were other computer-related activities.

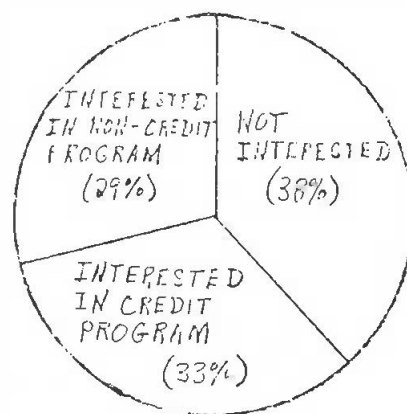
HIGH SCHOOL STUDENTS QUESTIONNAIRE

This questionnaire was designed to seek information on what was known about the computer and the network by students who were not enrolled in any formal computer course but who had a terminal available in their school. Replies were received from 817 such students. Most of them (62%) indicated that they did not intend to take any computer course in the future. The majority (80%) were aware that a terminal existed in their school, having learned about it from a fellow student or a teacher; 195 students had seen the computer used in their classes in various ways, many involving subjects other than the computer courses.

Many of these students, while not committed to a full computer course, were interested in short introductory courses. Only 38% of the respondents said they would not be interested on any basis; 33% of the students would have been interested if the short program could have been for credit; and 29% of the students would have been interested in a non-credit or extra-curricular course. However, 49% of the respondents felt that these courses should have been available before Grade XI, 12% felt they should not, and 39% were undecided.

FIGURE 6

Response to the question, "Would you be interested in a short introductory course?"



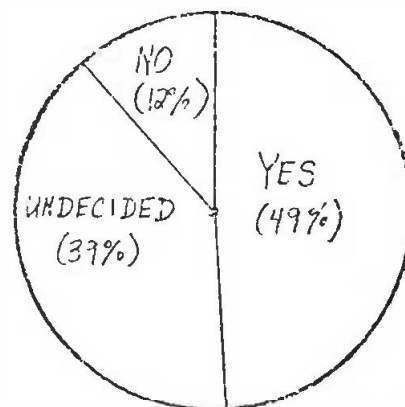
ATTITUDES CHECKLIST

A 20-item checklist was designed to query students on the effects of the computer on their attitude to school subjects, to their future, to their personal relationships, and to the role of the computer in society. Each student responded to the set

of items twice - once on the basis of what he perceived were the computer's effects on him and once on what he felt should be the computer's effects on him. While most of those who replied perceived the computer as influencing their lives very little or slightly favorably, there was little difference between their perceptions of how it affected them and how it should affect them.

FIGURE 7

Response to the question, "Should an introductory course in the use of the computer be available before Grade XI?"



CONCLUSIONS

The evaluation committee viewed this evaluation as the beginning of an ongoing evaluation. They felt that many questions remain unanswered and, indeed, unasked.

NCTM's New Member and Subscription Fees

Please note the changes in current membership fees of the National Council of Teachers of Mathematics as listed below (membership dues payment includes \$5.50 for a subscription to either the *Mathematics Teacher* or the *Arithmetic Teacher* and 25¢ for a subscription to the Newsletter):

\$12.00 (includes one journal - specify which you wish to receive)

\$17.50 (includes both journals)

\$ 1.00 additional fee for an individual subscription to the *Mathematics Student*

\$ 7.00 additional fee for a subscription to the *Journal for Research in Mathematics Education*.

For each journal desired, add \$1.00 for mailing outside the U.S.A.