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ABSTRACT

An experiment was conducted to demonstrate the feasibility of using the teaching computer as a medium for involving people in community planning. A program on environmental issues was presented on the PLATO system to a non-random sample of citizens of Champaign-Urbana, Illinois. Civic and government leaders and interested citizens attended demonstrations related to a local environmental issue. Data collected from the experiment suggest that people are willing to work through such a program and would like to see more issues presented this way. Participants found the computer useful for presenting concise and relevant information, and they found particular advantage in being able to make comments and responses to questions. Suggestions were made for including more information on costs, sources of information, political considerations, and views of the various interest groups. Criticisms primarily concerned the inconvenient location of computer terminals and the presence of some bias in the program. (CH)

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NEW DIRECTIONS FOR THE TEACHING COMPUTER: CITIZEN PARTICIPATION IN COMMUNITY PLANNING

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NEW DIRECTIONS FOR THE TEACHING COMPUTER:

CITIZEN PARTICIPATION IN COMMUNITY PLANNING

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An early draft of this paper was prepared for the First General Assembly of the World Future Society held in Washington, D. C. on May 12, 13, 14, and 15, 1971. The research at that time was supported by the Program on the Social Implications of Science and Technology at the University of Illinois under National Science Foundation Grant GR-60. The present draft was supported by the National Science Foundation under grant GZ 2538.

The research described was conducted using the Plato system at the Computer-based Education Research Laboratory at the University of Illinois at Urbana-Champaign. The laboratory has been supported in part by the National Science Foundation under grants NSF GJ 81 and GJ 974; in part by the Advanced Research Projects Agency under grant ONR Nonr 3985(08): in part by Project Grant NPG-188 under the Nurse Training Act of 1964, Division of Nursing, Public Health Service, U.S. Dept. of Health, Education and Welfare; and in part by the State of Illinois.

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ABSTRACT

In 1970 an experiment was conducted to demonstrate the feasibility of using the teaching computer as a medium for involving people in community planning. A program on an environmental issue was presented on the PLATO system to a non-random sample of the population of Champaign-Urbana, Illinois. The participants included government leaders, civic leaders and interested citizens. The data from this experiment suggests the following:

1. People from the community were willing to come to work through the program.

2. Participants found the medium useful for presenting concise and relevant information.

3. Presentation of information in this way may be particularly useful for those who have not yet formed an opinion on the issue.

4. Participants found particular advantage in being able to make comments and respond to questions.

5. Participants indicated that they would like to see more issues presented in this way.

Useful suggestions were also made for including more information on costs, sources of information, political considerations, and views of the various interest groups. The criticisms dealt primarily with the inconvenient location of the terminals and the presence of some bias in the program.

Since the middle of the 1960's increasing demands for citizen participation in policy formulation have been expressed at all levels of government. A number of federal programs have specified that affected populations be included in policy formulation.[1] Reforms in the Democratic Party have resulted in increased representation of minority groups, the young, and women. At the local level, community groups have formed to express their views on issues such as education, urban renewal, and cable television.

Accompanying the demands for participation has been a recognition of the need for new methods of participation. The communications media have responded with radio "talk" shows, more television documentaries, and programs such as The Advocates which encourage written viewer responses. Several experiments are underway with two-way cable television.

There is some doubt, however, whether the various methods of participation now available are cost-effective for the people involved---whether the time and effort a person puts into participation results in a feeling that the time was well spent and something was accomplished. With present methods, a citizen can participate only at a time designated by others. The citizen also has very little control over the type and amount of information presented at meetings or on the media. Issues of immediate concern to him may be given scant attention. Finally, the citizen cannot control the rate at which information is presented, so he is sometimes bored and sometimes lost.

Recognizing the limitations of existing methods of citizen participation, a group of graduate students at the University of Illinois began thinking about how another technology, the teaching computer, could be used as a more

effective medium for involving people in a discussion of community issues.[2] We decided to explore the feasibility of using the teaching computer for citizen participation by conducting an experiment which would involve the members of the local community in a discussion of an environmental issue.

The technology which was used in this experiment is the PLATO system located at the University of Illinois in Urbana-Champaign.

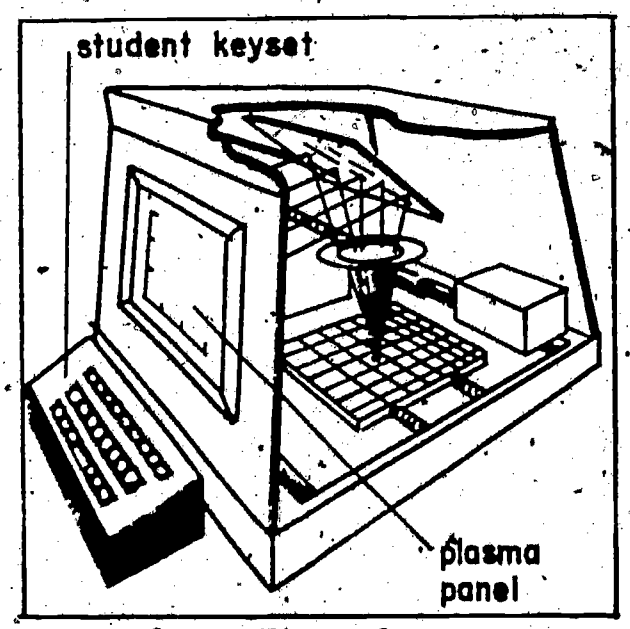
The PLATO III system consists of a Control Data Corporation 1604 computer and 56 terminals, 20 of which can be operated simultaneously.[3] Thirty-two terminals are located on the University of Illinois campus and 24 are located at remote sites including an elementary school and a junior college.

A terminal consists of a typewriter-like keyboard by which the user sends messages to the computer and a television screen which displays computer-generated graphic information and computer-selected photographic slides to the user. (See Figure 1).

During the next three to four years, the PLATO system is scheduled to expand from the simultaneous operation of 20 terminals (PLATO III) to the simultaneous operation of 4000 terminals (PLATO IV).[4] These terminals will be distributed throughout the state of Illinois. Currently, 35 PLATO IV terminals (see Figure 2) have been delivered to the University of Illinois. Delivery will continue at an accelerated rate until 4,000 terminals are available.

The PLATO system has been developed primarily as an educational device. However, the expansion of the PLATO system and the probable widespread distribution of similar equipment over the next few decades suggests that we are discussing not simply an educational device but a new type of mass communications system which offers the possibility of two-way communication among various interest groups.[5] Such a system would seem to suggest a number

PLATO III Terminal
Figure 1



PLATO IV Terminal: Cross Section.

Figure 2

of uses beyond normal classroom activities. One of these activities may well be the involvement of a larger number of people in considering community goals.

PREPARATION OF THE PROGRAM

The initial preparations for conducting an experiment on the possibility of using a new communications technology to involve the public in social planning began during the fall of 1969. Several items were of immediate concern: 1. Issue selection, 2. Gathering of information, 3. Presentation of information, and 4. The time required for research and programming.

Issue Selection

A number of factors were taken into account in selecting an issue for this study: a. The issue should be of importance to both Champaign and Urbana, b. The issue would have to be familiar to the general populace, c. The issue should lend itself to medium or long-range planning, and

d. Because we were attempting to determine the feasibility of using this technology to discuss community issues, the first issue would have to be relatively non-political but somewhat controversial.

At the time that we were considering possible issues, the concern over the environment was increasing significantly in the United States and in Champaign-Urbana. These were the months immediately preceding the first Earth Day. Environmentalists in the two cities were concentrating their efforts on a stream, the Boneyard Creek, which runs through Champaign, the University of Illinois, and Urbana. The stream has been polluted by businesses and homes in the area. Some areas of the Boneyard Creek have been covered over and in some sections the banks have been sheetpiled, allowing structures to be built closer to the edge of the stream. A number of University and community groups had initiated a community-wide effort to save the creek. The county's planners intended to eventually convert the creek into a storm sewer by covering it over. The environmentalists wanted to clean it up and landscape it.

The Boneyard Creek issue seemed to have all of the desirable characteristics for our first community issue on PLATO: 1. Not only Champaign and Urbana, but also the University of Illinois were involved, 2. People in the community were discussing the issue, 3. Background information had been developed and the various solutions which were being discussed involved medium and long-range planning, and 4. The issue was controversial but did not arouse violent passions. Thus, the Boneyard Creek became the subject of the first computer-based program for discussing a community issue.

Gathering Information

Two groups, the Champaign County Development Corporation and the Concerned Engineers for the Restoration of the Boneyard had conducted extensive research

and had developed alternative plans for the Boneyard Creek.[6] The reports generated by these groups provided the background information for the computer-based program.

Interviews were also conducted with resource persons from Champaign, Urbana, and the University of Illinois who were involved in the issue.

Presentation of Information

The program presented information to the participants in the form of written material, pictorial slides, maps, and graphs. In order to ensure that the participants all had the same basic information on the issue, we decided to have a simple information sequence format with a number of optional branching sequences. The main subjects covered included the following:

1. Introduction
2. History
3. Current plans
4. Presentation of alternatives
5. Discussion of advantages and disadvantages of alternatives
6. Actions which citizens might take
7. Questionnaire

All of the participants viewed the information in the same order. The "branching sequences" provided additional information and were optional. They did not affect the order in which the participants viewed the necessary background material.

Because a number of technical words were used, a "dictionary" of terms was incorporated into the program so that the participants could obtain precise definitions of words or technical phrases which were unfamiliar to them.

A series of questions was also asked in the main body of the program to insure that a minimum level of information about the issue was being learned.

A "comment mode" was incorporated into the program. This sub-routine allowed the participant to stop at any point in the program to criticize the information, to ask questions, or to suggest additional considerations.

The program concluded with a questionnaire which attempts to identify biases in the program and to determine the usefulness of this medium in discussing community issues.

Research and Programming

The total amount of time spent in conducting interviews, researching the issue, and placing the program on the computer amounted to approximately one academic year. However, this work was carried out on a part-time basis and as a project to fulfill a requirement for a graduate course. In addition, much of the research had been compiled by other groups in the communities. The greatest amount of time was spent in arranging the information and in programming.

PRESENTATION TO THE COMMUNITY

Approval to carry out this project had been obtained from the Director of the PLATO Laboratory, Donald L. Bitzer. We then approached the local government leaders and the mayors of Champaign and Urbana with the idea of using a teaching computer to involve community members in a discussion of social planning. In both instances, we explained the anticipated expansion of

the PLATO system and the nature of the experiment which we wanted to conduct. Both government leaders were receptive to the idea and gave us their encouragement.

The participants who attended the "Future of the Boneyard Creek" demonstrations were not randomly selected from the population. The first demonstrations of the program included those people who were involved in some way with the Boneyard Creek issue and who could offer suggestions and criticisms on the program. The remaining demonstrations included Aldermen and Councilmen from Urbana and Champaign, the City Manager of Champaign, members of local government departments and agencies, leaders of community organizations such as the League of Women Voters and the Champaign County Development Corporation, faculty members and students from the University of Illinois, and representatives from the two local newspapers, the university's student newspaper, and the university's public information office.

Participants were invited to see the Boneyard Creek program by sending out invitations which included a cover letter describing the project and the PLATO system. Between June, 1970, and November, 1970, a total of 118 invitations were sent out to members of the community. Forty-two persons, a response rate of 35.5%, attended the demonstrations.

After November, 1970, the experiment was sufficiently well-known that we could approach individuals or groups directly, or we would be contacted by those interested in the program. Between January, 1971 and April, 1971, 65 more persons attended demonstrations of the program, bringing the total number of participants to 107.

RESULTS OF THE EXPERIMENT

Between June, 1970 and April, 1971, a total of nine demonstrations were given during which data was collected on 77 participants. During this same time period, numerous other demonstrations were given; however, data either was not collected or the data on the tapes was not sorted.

It should be noted again that the participants who attended these demonstrations were not randomly selected from the population. The responses to questions discussed in this paper should not be generalized to the total population.

Questions Presented in the Program

A series of four questions were asked during the program which were designed to determine the level of information on the Boneyard Creek. The questions and responses are presented in Table 1. The general awareness of the participants on the issue seemed rather high. However, a significantly large minority of people had not seen sheetpiling and a large minority of people could not correctly identify a definition of sheetpiling.

Table 1

QUESTIONS PRESENTED IN THE BONEYARD CREEK PROGRAM

Question	Response (N=77)
1. Do you think that the Boneyard is presently used as:	
a. A STORM SEWER to carry off rain water.	14
b. A SANITARY SEWER to carry wastes.	0
c. A combination of SANITARY SEWER and STORM SEWER.	63

The correct response is "c".

Table 1 (cont.)

		Response
2.	Another factor in the flooding problem is the RUNOFF RATE:	
	Do you think that Champaign-Urbana has:	
	a. A fast RUNOFF RATE.	44
	b. A slow RUNOFF RATE.	33
	The correct answer is "a".	
3.	SHEETPILING, a common sight along the creek, especially in Urbana, was another solution to the flooding problem.	
	Have you had an opportunity to see SHEETPILING in the Champaign-Urbana area?	
	a. Yes	35
	b. No	28
	c. Don't Know	14
4.	SHEETPILING refers to:	
	a. The construction of concrete "walls" along the sides of the creek.	20
	b. Lining the Boneyard with Butyl rubber to increase the cross-sectional area of the creek.	1
	c. Pieces of interlocking steel driven vertically into the ground.	51
	d. Stockpiling linen closets.	3
	e. Covering the bottom of the creek with steel sheets to eliminate the problem of rock obstructions.	2
	The correct answer is "c".	

Opinion Question

In order to determine the general opinion on a suggested solution to the problem, the participants were asked what they thought should be done with the Boneyard Creek. The question and responses are presented in Table 2. Responses indicated that a majority of the participants favored either a land improvement program or a combination program of sheetpiling and landscaping.

Table 2

QUESTION
WHAT SHOULD BE DONE WITH THE BONEYARD

Question	Response (N=77)
1. In your opinion, what should be done with the Boneyard?	
a. Continue sheetpiling the creek.	4
b. Initiate a Land Improvement Program.	41
c. Combine a program of sheetpiling and landscaping.	21
d. Do nothing with the Boneyard.	2
e. Don't Know at the present time.	5
No response	4

Branching Sequences

Three "branching sequences" were incorporated into the program. A description of the branching sequences and the number of participants who selected each sequence are presented in Table 3. In each instance, a majority of the participants chose to view the additional information in the branching sequence.

Table 3

BRANCHING SEQUENCES

Branching Sequence (Subject Area)	Number of People Who Selected the Branching Sequence	Number of People Who Did Not Select the Branching Sequence (N=77)
1. Runoff and Runoff Rates	55	22
2. Pollution	51	26
3. What Other Cities Have Done	57	20

Dictionary of Terms

Table 4 presents a list of the terms available in the program and the number of times the participants requested a definition of each term.

In addition to frequently selecting definitions of terms, the participants generated a list of terms which had not been defined in the program. That is, the participants frequently requested a definition for a term which had not been included in the dictionary. The computer recorded this information, thereby enabling the programmer to make additions to the "dictionary" list.

Table 4

LIST OF TERMS

Term	Number of Participants Who Selected a Definition of the Term
1. Box Culvert	29
2. Box Sewer	9
3. Easement	4
4. Fee Simple	8
5. Runoff	8
6. Runoff Rate	10
7. Sanitary Sewer	12
8. Sheetpiling	24
9. Storm Sewer	22
10. Watershed*	65

*A large number of participants selected a definition of the word "Watershed", because it was used in the example to explain how to obtain additional information on a term.

Comment Mode

A "comment mode" was incorporated into the Boneyard Creek Program on February 24, 1971. Prior to this time, the participants wrote out their comments

on paper. The data collected thus far in the comment mode during the course of the program has been insufficient for a useful analysis. However, a sampling of the comments made by the participants can be seen in Table 5.

Table 5

A SELECTION OF COMMENTS MADE BY PARTICIPANTS

USING THE COMMENT MODE*

1. what the boneyard is supposed to be used for and what it is being used for now are completely the opposite statements. C is correct if the Boneyard is being used as bot a sanitary sewer and a storm sewer.

2. ques was what creek was not what it wass

3. Is it still possible to reconvert the boneyard to a storm sewer or has deterioration gone too far
do natural underground sewers currently exist
can laws be passed which would regulate flow of sewage into boneyard in the future
it would seem better to initiate a land improvement program which would control flow in the creek through more natural methods and make available land for parks or even just more pleasant land around homes and business and would save perhaps, some of the money used in destroying the environment with sheet-piling
also problems such as traffic control

4. It seems to me that even though the cost of sheetpiling appears to be a lot, and effective land development plan would cost much much more. How feasible would this be?
Again, the cost of landscaping alone would be less than sheetpiling, but what about the added cost for eliminating pollution?

5. Why has the Boneyard been left tocarekess abaned?

6. very nic
this is a very interesting program

7. the original question did not ask what

8. I think that that would be a good idea to make a
I can clearly see that a big problem exists and I certainly would, like to see something done about it, but I also sympathize with the landowners along the creek. Have they expressed any opinions on the matter?

*Typographical errors and incomplete sentences are a result of how participants typed the comments, not technological problems.

Questionnaire Presented at Conclusion of Program

After the participants had completed the program, they were asked to answer a series of four questions at the end of the program. These questions were designed to elicit responses on 1. bias in the program, and 2. the usefulness of this medium for discussing community issues. The questions and responses are presented in Table 6.

Table 6

QUESTIONNAIRE ON BIAS AND USEFULNESS OF MEDIUM

1. In developing this program, we attempted to be as objective and unbiased as possible.

   Did you see any bias in the program?

a. Yes	29	
b. No	41	
c. No Opinion	4	n=77
No Answer	3	

   1a. If yes, in what direction was the program biased?
   1b. What specific sections were biased?

2. Would you like to see more programs on community issues written and presented on PLATO?

a. Yes	70	
b. No	1	
c. No Opinion	3	n=77
No Answer	3	

3. Do you think that this is a useful way to look at information on community problems for a person like yourself?

a. Yes	64	
b. No	5	
c. No Opinion	4	n=77
4a. Why? No Answer	4	

While the majority of participants, 33.2%, felt that the program was unbiased, a significant portion indicated a bias present in the program. These participants felt that the bias was primarily in the direction of a landscaping program. A complete list of "directions of bias" is presented in Table 7.

Table 7

DIRECTIONS OF BIAS

DIRECTIONS IN WHICH PROGRAM WAS BIASED	FREQUENCY WITH WHICH ITEM WAS MENTIONED
1. Land Improvement Program	13
2. Against Sheetpiling	3
3. Cleaning up the Boneyard	2
4. Complete Change for the Boneyard	1
5. Exclusion of Opinions of Industry	1
6. Mediocrity	1
7. Natural Beauty	1
8. Social as Opposed to Economic Aspects	1
	n=23

These participants were also asked what specific sections were biased. The participants indicated that the sections most biased included 1. Sheetpiling, 2. Presentation of alternative courses of action, and 3. a Land Improvement Program (See Table 8).

Table 8

SECTIONS WHICH WERE BIASED

RANK ORDER BY FREQUENCY WITH WHICH ITEM WAS MENTIONED

BIASED SECTIONS	FREQUENCY WITH WHICH ITEM WAS MENTIONED
1. Sheetpiling	5
2. Presentation of Alternatives of Action	5
3. Land Improvement Program	4
4. Entire Program	1
5. Slides Used Throughout the Program	1
6. Community Groups	1
7. Other Cities	1

Over 90% of the participants indicated that they would like to see more issues discussed on PLATO. When asked what issues they would like to see presented on this medium, they seemed primarily interested in those issues dealing with ecology, race relations, and university-community relations. Table 9 presents a complete list of issues suggested by the participants.

Table 9

RANK ORDER OF COMMUNITY ISSUES BY FREQUENCY WITH WHICH THE ISSUE IS MENTIONED

Table 9 (cont.)

ISSUE	FREQUENCY WITH WHICH ITEM WAS MENTIONED
1. Ecology (preservation of wild lands, pollution)	15
2. University-Community Relations	7
3. Race Relations	11
4. Transportation	6
5. University Issues	5
6. Politics	4
7. Recreation and Park Facilities	4
8. Voter Demands	3
9. Education	3
10. Local Business	3
11. Housing	3
12. Urban Planning	2
13. Student Dissent	2
14. Police-Community Relations	2
15. Student Vote in Local Government	2
16. Student Rights	2
17. Laws and Ordinances	2
18. Local Government	2
19. Law Enforcement	1
20. Draft	1
21. Illinois Public Interest Research Group	1
22. Zoning Ordinances	1
23. Employment	1
24. Population	1
25. Southeast Asia	1
26. Poverty	1
27. Pesticides	1

Over 80% of the participants also felt that this was a useful way to look at information on community issues. They found it useful primarily because it seemed more objective and unbiased, required less time than other media, and the material was more concise. The responses listed by the participants indicating why they found this to be a useful way to discuss community issues can be found in Table 10.

Table 10

RANK ORDER OF ADVANTAGES BY FREQUENCY WITH WHICH THE ITEM HAS BEEN MENTIONED

ADVANTAGE	FREQUENCY WITH WHICH ITEM IS MENTIONED
1. Objective and Unbiased	13
2. Direct and Concise	11
3. Requires less time	10
4. Convenient	8
5. Factual	6
6. Educational	6
7. More Information	5
8. New way to get information	4
9. More personally involved	4
10. Presents background information	4
11. All material located in one place	3
12. Can easily give responses	3
13. More credible	2
14. Can select information to be viewed	2
15. Entertaining	2
16. Helps you to understand others views	1
17. Captive audience	1
18. Can review the material	1
19. Keeps one up-to-date on the issues	1

Written Questionnaire

Upon completion of the computer-based program, the participants were asked to complete a written questionnaire on the program. A total of 101 questionnaires were given out, 91 of which were returned. The questionnaire and responses are presented in Table 11.

Table 11

QUESTIONNAIRE ON BONEYARD CREEK PROGRAM

1. Do you think that this program has been:

too long	11
too short	3
just right	70
no opinion	7
	n=91

2. Do you feel that the program contained:

too much information	5
too little information	13
adequate information	72
no opinion	0
	n=91 (1 NA)

3. Did you feel that there were too many technical terms presented in this program?

yes	0
no	91
no opinion	0
	n=91

Table 11 (cont.)

4. Was there any information that you wanted but was not presented in the program?

yes	32
no	57
	n=91 (2 NA)

5. Did you ever feel bored going through this program?

yes	23
no	67
no opinion	1
	n=91

6. Before you saw this program, what was your opinion about what should be done with the Boneyard?

sheetpile it	2
landscape it	30
combination of sheetpiling and landscaping	22
other (specify)	11
no opinion	26
	n=91

7. Did this program change your mind about the Boneyard?

yes	34
no	54
no opinion	2
	n=91 (1 NA)

8. Would you be interested in coming here again to work through a program on another community issue?

yes	84
no	1
don't know	6
	n=91

Table 11 (cont.)

8a. Would you invite your friends to participate, too?

yes	84
no	1
don't know	6
	n=91

9. Do you see any advantages or disadvantages that this medium offers over others, such as the newspaper, radio, and television?

To briefly summarize the results of the questionnaire, the participants indicated that the program was "just right" in length (the average completion time was 1/2 hour), contained an adequate amount of information, and did not present too many technical terms. The participants did not seem to find the program boring and indicated that they would be interested in going through another program on a community issue and would also be willing to invite their friends to participate.

A substantial number of participants indicated that they sought information which was not presented in the program. Additional information was requested primarily on costs and terms of a land improvement program, political information, views of other groups in the community, and facts about pollution. A complete list of types of information sought is presented in Table 12.

Table 12

TYPES OF ADDITIONAL INFORMATION SOUGHT BY PARTICIPANTS

Table 12 (cont.)

Type of Information	Frequency With Which Item was Mentioned
1. Costs and Terms of a Land Improvement Program	7
2. Political information	6
3. Views of other groups in the community	5
4. Pollution	5
5. Explanation of more terms	3
6. Community plans	2
7. Sources of information	1
8. How to get personally involved	1
9. Program print-out	1

While the majority of the participants did not feel "bored" going through the program, those who did feel this way became bored with particular sections of the program, such as the history of the Boneyard Creek and the section dealing with other cities. Others became bored because they had previous knowledge of the issue, or found the quality of the images presented on PLATO III to be poor.

The responses indicated that a majority favored either a landscaping program for the Boneyard, or a program which combined landscaping and sheet-piling. A majority also stated that the computer-based program did not "change their mind" about the Boneyard Creek issue. It is significant to note that of those who did change their mind, 60.6% had previously held no opinion on the issue.

The last question asked whether the teaching computer had any advantages or disadvantages over the other media. The participants described more advantages than disadvantages. In particular, they noted that the teaching computer involved active participation in that the participants could give comments or answer questions; the branching sequences allowed the participants to select the information which they wanted to view; and the program seemed more unbiased than the other media (Table 13).

Table 13

ADVANTAGES OF THE TEACHING COMPUTER

Advantage	Frequency With Which Item Is Mentioned
1. Active Participation	20
2. Branching sequences	12
3. Unbiased	10
4. More personal	7
5. More informative	7
6. Can progress at own rate	6
7. Defines terms	6
8. Feedback	5
9. Can review information	4
10. Requires less time than other media	3
11. Educational	2
12. Material available in one place	2
13. Participant can control responses	2

Table 13 (cont.)

14.	Facilitates concentration on a specific issue	1
15.	Removes politics from decision-making process	1
16.	Convenient	1
17.	Not affected by others around you	1
18.	Opinion sampling can be conducted more quickly	1

The primary disadvantages (Table 14) described included biased information, inconvenience of the location of the terminals, and the fact that this medium cound reach only a limited audience.

Table 14

DISADVANTAGES OF THE TEACHING COMPUTER

Disadvantage		Frequency With Which Item is Mentioned
1.	Biased	8
2.	Inconvenient location	1
3.	Costly	3
4.	Reaches only limited audience	3
5.	Requires too much time	2
6.	Poor quality of images	2
7.	Trivial information	2
8.	Requires too much effort	2
9.	Screen too small	1

Table 14 (cont.)

10.	Community residents would react against the academic approach	1
11.	Inconvenient scheduling	1
12.	Simply another written paper	1
13.	Can present only a limited amount of material	1
14.	Unknown to general public	1
15.	No sound	1
16.	Information already known to decision-makers	1
17.	Too static	1
18.	Too slow	1
19.	Difficult to operate terminals	1

The data which has been collected thus far on the Boneyard Creek program has indicated that, in general, the participants have reacted favorably to this new type of communications technology and its possible applications in the community planning area. The comments and criticisms made by the participants have also suggested a number of changes to be made in the program before it is presented to a random sample of the population in the communities. These changes include the following:

1. Increase the number of branching sequences.
2. Expand the "dictionary" of terms.
3. Suggest more alternatives.
4. Present more questions designed to insure minimum information levels.
5. Include the viewpoints of more groups in the community.
6. Incorporate the written questionnaire into the computer-based program.

Further Considerations

The data gathered from this experiment suggests that this technology can be used as a communications medium to discuss community issues. This experiment also raises a number of questions which will have to be dealt with as research in this area continues:

1. Issue Selection---Some decision will have to be made concerning the selection of issues to be programmed. One possibility would be to allow the citizenry themselves to suggest and vote on the most important issues for consideration.

2. Information Gathering---Quality programs depend on adequate information. This will probably necessitate more efficient information gathering procedures. In the same context, procedures will also have to be established which will insure adequate representation of all the alternatives suggested by interest groups.

3. Cost/Benefit Analysis---As other technologies provide methods for participation, consideration should be given now to ways of measuring the effectiveness of the various technologies for the individual in terms of participation, learning, satisfaction, etc..

4. Control of Information---One of the most important questions is that of information control. In order to prevent the abuse of this technology, a community council might be established with rotating membership. This council could function to insure that all sides of an issue are represented, that information is accurate, and that the data gathered and presented to decision-makers is not manipulated.

5. Other Uses---In addition to presenting information on issues, the teaching computer may offer other uses. One possibility is that government leaders or interest groups in different communities might use terminals to conduct Delphi-like conferences. Another possibility is to let interest groups develop strategies on issues using basic information on the community.

These few questions do not exhaust the many problems and considerations which will have to be taken into account as research continues in this area. They do suggest that much more experimentation is needed if this technology is to develop into mass communications medium useful for a variety of purposes.

FOOTNOTES

1. For an overview of citizen participation in federal programs, see "Planning and Citizen Participation," Journal of the American Institute of Planners," July, 1969, Volume XXXV, Number 4.

2. For more discussion of the computer and communications, see J. C. R. Licklider, "The Computer as a Communication Device," International Science and Technology, April, 1968; Chandler H. Stevens, "Citizen Feedback and Societal Systems," Technology Review, January, 1971; and Thomas B. Sheridan, "Citizen Feedback: New Technology for Social Choice," Technology Review, January, 1971.

3. PLATO III originally consisted of 72 terminals. As the PLATO IV system replaces the PLATO III system, the older terminals are being phased out.

4. D. L. Bitzer and D. Skaperdas, "PLATO IV: An Economically Viable Large-Scale Computer-based Educaiton System," paper presented at the National Electronics Conference, Chicago, 1968.

5. Stuart Umpleby, "Citizen Sampling Simulations: A Method for Involving the Public in Social Planning," Policy Sciences, Vol. 1, No. 3, Fall 1970.

6. Much of the information contained in the Boneyard Creek program was based on an unpublished report prepared by a group of students, The Concerned Engineers for the Restoration of the Boneyard. The report was directed by Bruce Hannon, assistant professor of Engineering at the University of Illinois, Urbana, Illinois.

Appendix A

THE BONEYARD CREEK PROGRAM

EXAMPLES OF FRAMES SEEN ON SCREEN

Current Plans for the Boneyard

The future of the Boneyard will ultimately be decided by the people of Champaign-Urbana. There are three courses of action which you may consider:

1. Continuation of sheetpiling.
2. A Land Improvement Program.
3. Each of the above would be carried out over a period of years, and the actual result might be some combination of the two.

Before we look at each proposal more carefully, we would like to find out which alternative you prefer at the present time.

In your opinion, what should be done with the Boneyard?

a. Continue sheetpiling the creek.
b. Initiate a Land Improvement Program.
c. Combine a program of sheetpiling and landscaping.
d. Do nothing with the Boneyard.
e. Don't know at the present time.

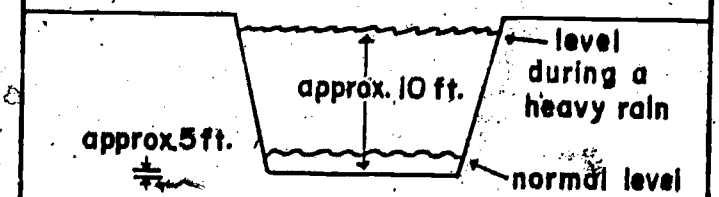
→

Advantages of Sheetpiling

SHEETPILING a stream accomplishes a number of purposes:

1. SHEETPILING effectively prevents the erosion of the banks of a stream which can in time undermine the foundations of buildings.
2. The increasing water flow during rain storms, which is a primary concern of the developing Champaign-Urbana area, can be easily accomodated.
3. SHEETPILING provides a limited amount of room for the physical growth of Champaign and Urbana.

In case you haven't noticed, the water level in the Boneyard is not constant. It is usually very low, but during a heavy rain, the level of the creek is far above normal.



This sketch of a cross-section of the creek indicates how much the level of water in the creek actually does vary.

Regardless of what course of action Champaign and Urbana follow for the Boneyard, the pollution must stop and the violaters of public law must be prosecuted.

Press

a. If you would like to know more about pollution.
b. If you want to go on quickly.