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**Personal computers and the liberating aspects for human  
creativity**

**Scott, Gayle Wimberley, Ed.D.**

**The University of North Carolina at Greensboro, 1990**

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PERSONAL COMPUTERS AND THE  
LIBERATING ASPECTS FOR  
HUMAN CREATIVITY

by

Gayle Wimberley Scott

A Dissertation Submitted to  
the Faculty of the Graduate School at  
The University of North Carolina at Greensboro  
in Partial Fulfillment  
of the Requirements for the Degree  
Doctor of Education

Greensboro  
1990

Approved by

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APPROVAL PAGE

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This narrative inquiry study of selected adults from the UNCG faculty and staff focused on seeking out positive feelings which occur when this group of people use personal computers. A preliminary survey was mailed to identify participants who would be interviewed. The names had been gathered from C-TEP grant recipients, faculty, and staff on campus. Twenty-one adults ranging from 21 to 59 years of age were interviewed. Seven who were from different departments on campus were selected for description, including two females and five males.

The interviews were transcribed and analyzed for recurring themes. The major themes which emerged were learning style, rising expectations, playfulness, liberation, and creativity. Each theme with the attained rich data is presented in narrative form.

The conclusions revealed that these individuals use their personal computers in liberating and creative ways and that they essentially use computers for intrinsically motivating reasons. It was primary that most of them perceive that they are enabled to do activities with their personal computers that would be impossible without them. In some cases, the discernment is made that they are stimulated to liberative and creative activities by their personal computers.

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CHAPTER I  
INTRODUCTION

When some people, including the writer, use personal computers (PC's), they use the PC for liberating and creative activities. This narrative inquiry study focused on positive feelings occurring when people use personal computers. Much has been written of the negatives of technology, particularly of computers; less has been written of the positive aspects.<sup>1</sup> Therefore, little is known of the actual positive phenomena which occur during the use of personal computers.

POSITIVE PHENOMENA TO ANALYZE

Though it was planned to enter the interviews with an open mind and a plan for flexibility, there were some assumptions regarding positive phenomena that occurred when these individuals used personal computers. These positive phenomena were derived from the writer's personal experiences and were used as guidelines in developing a list of possible questions or topics to cover in each interview. The preliminary group of phenomena that were considered prior to

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<sup>1</sup>Theodore Roszak, Herbert Marcuse, and Joseph Weizenbaum in particular write of the negative aspects of technology, especially computers. Sherry Turkle presents a number of both negative and positive experiences. It bears noting, however, that Roszak himself uses a computer and states that the computer is not "worthless or malevolent."

the interview stage were those which were presumed to occur when these individuals were:

- excited about using the personal computer in any type of activity, particularly to the extent that a special experience or lost sense of self and/or time occurred;
- learning something that was particularly difficult for them, yet they were able to accomplish this while using a personal computer;
- performing tasks they thought might not be possible, particularly those of a creative or entrepreneurial bent.

The preliminary phenomena and the comments of the respondents on the initial survey were used in developing a list of question topics to be covered in the interviews. This list of question topics (see Appendix A) was to be used as a guide for the interviews, with the understanding that probing questions might be needed to stimulate conversation and that individuals could be expected to make comments that might incite another direction of thought during the interview. An additional list of probe question ideas (see Appendix B) was prepared in case of need.<sup>2</sup>

The primary questions used to guide the actual interview were developed while considering the suggestions of a number of authors who specialize in qualitative research methods and use interviews as the primary method of data collection. These authors recommended ways of asking questions in order to

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<sup>2</sup>J. Stacy Adams, Interviewing Techniques (Chapel Hill: The University of North Carolina Press, 1958), 25-27.



elicit descriptive answers rather than limited "yes" or "no" answers.<sup>3</sup>

Theodore Roszak's primary objection to computers is in how they are used and the linking of information and computers in the public mind. He is also concerned about the morally questionable uses of computer power and the real possibility that educators will be swept into the "cult of information." He offers the idea that we have almost lost the possibility of utilizing personal computers in idealistic and socially valuable ways. He concludes, however, that since we made this "information environment," we can also change it to our higher values. Roszak believes that we do not meekly have to remain victims of whatever culture we have created and would like to see us "save this remarkable invention."<sup>4</sup>

The significant ideas on which this study focused are: 1) how a selected group of faculty, staff, and students at the University of North Carolina at Greensboro (UNCG) use personal computers; and 2) what liberating and creative experiences occur during their usage of personal computers.

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<sup>3</sup>A compilation of ideas from Adams, Benjamin, Bogdan and Biklen, and Taylor and Bogdan resulted in the ways of presenting the questions in Appendix A. The questions were not read during the interview; in general, the topics were converted into questions which fit into the interview in progress. Occasionally some topics did not apply to a particular individual.

<sup>4</sup>Theodore Roszak, The Cult of Information: The Folklore of Computers and the True Art of Thinking (New York, Pantheon Books, 1986), pp. ix-xii, 43, 153-155.

### PURPOSE OF THE STUDY

This narrative inquiry study of selected adults from the UNCG faculty and staff focused on seeking out positive feelings which occur when people use personal computers. Much has been achieved through this remarkable invention and the study attempted to demonstrate some of the accomplishments which have been made at UNCG.

### THE ISSUES

There were several issues of primary importance in a discussion relating to personal computers, liberation, creativity, and aesthetics (as a related matter). The central issue was to discover if personal computers (PC's) do in fact assist, stimulate, or offer any value in creative or aesthetic pursuits for the individuals in the study. Second, if there are creative or aesthetic experiences for some people, the question arises of why all persons using them do not have such experiences--if this can be determined within the limits of this study.

A third issue, if PC's are liberating, is whether they are liberating for all people involved in this study or only certain ones. A fourth issue is whether personal computers are more useful in individual creative and aesthetic pursuits or are more likely to be associated with liberating experiences than are larger computers.

A final issue is that if personal computers are used in liberating and creative ways by some but are not presently being so used by most, then perhaps there is benefit in promoting such application in the future. This may be one way to arrive at a new level of use for this technology.

#### GUIDING QUESTIONS

The first guiding question of this study was, are there instances in which personal computers provide creative or aesthetic experiences for the computer users in the sample? If so, then it is of benefit to determine whether there are common themes around which such individual experiences can be studied.

The second question for this study was, are there patterns of use in which personal computers are a component of liberating experiences for the computer user? Again, an attempt was made to determine whether there are common emergent themes which can be studied, especially as regards the class (MS-DOS, Apple, etc.) or size of computers and type of software.

The third guiding question was what avenues exist by which this technology can be utilized to either assist humans in creative activities or to at least provide support in a way which can result in free time to pursue other such activities? It was this idea which was expressed by Marcuse as the

possibility for qualitative change in the use of computer technology.<sup>3</sup>

#### DEFINITIONS

The following words or phrases are used throughout the document and these definitions are presented to provide a common basis of understanding.

Aesthetic Experience. The perception of beauty in whatever capacity, experience, context, or object; a phenomenon which has its own intrinsic value. The experience is associated with artists and scientists, who all find deep satisfaction in the beauty of their creations and who "have an intellectual motivation that is fuelled by a positive evaluation of learning and achievement, and guided by aesthetic sensitivity...." It also is related to creativity in that "creators" appear to be aesthetically sensitive, even in childhood.<sup>4</sup>

Art. Broadly defined as "any formed expression of an imagined conception." Therefore, this extends across a milieu

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<sup>3</sup>Herbert Marcuse, One-Dimensional Man: Studies in the Ideology of Advanced Industrial Society (Boston: Beacon Press, 1964), 227-231.

<sup>4</sup>R. Ochse, Before the Gates of Excellence, (New York: Cambridge University Press of Mississippi, 1980), 123-124, 153; and influenced by the writings of Buermeyer and Lee.

of expressions from traditional art to problem-solving to living our lives to be more fully human.<sup>5</sup>

Computer User. A person who operates or utilizes a personal computer or larger computer and who may or may not be a computer programmer.

Creativity. The process that occurs when the imagination produces an idea which is perceived and for which the individual seeks a way to capture it in some medium, format, or symbol--in as nearly a perfect form as the idea. It also applies to the personality of the individual in that these people have certain characteristics which include--but are not limited to--imagination, autonomy, playfulness, tension, flexibility, and motivation.<sup>6</sup>

Hegemony. (1) The process where one class controls allied classes through moral and intellectual leadership. (2) The successful attempt of a dominant class to control the resources of state and civil society, especially through the mass media and educational system, thus establishing its view of the world as all inclusive and universal.<sup>7</sup>

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<sup>5</sup>Harold Rugg, Imagination (New York: Harper & Row, Pub., 1963), 35; and several chapters in John A. Glover, Royce R. Ronning, and Cecil R. Reynolds, ed., Handbook of Creativity, (New York: Plenum Press, 1989).

<sup>6</sup>The definition is a coalescence of ideas from the various authors considered in this study, particularly Erikson, Tardif and Sternberg, Ghiselin, Torrance, Rothenberg and Hausman, Storr, and Suchodolski and Duczynski.

<sup>7</sup>Henry A. Giroux, Anthony N. Penna, and William F. Pinar, ed. Curriculum and Instruction: Alternatives in Education (Berkeley, CA: McCutchan Publishing Corporation, 1981), 418.

Learning Style. The preferred way in which one acquires new knowledge and experiences with subjects or technologies. Some individuals prefer learning in formal classes with other students and with more structure. Others prefer learning on their own--whenever they choose, wherever they choose. As regards personal computers, they may prefer simply acquiring new hardware and software and trying everything with minimal reading of documentation.<sup>8</sup>

Liberation. Recognizing that one has the freedom to exert autonomy over one's own life--economically, politically, intellectually, creatively--rather than being controlled by events, accidents, history, machines, or other persons. The locus of control in the individual is the critical point. This liberation may take various forms, depending on the circumstances of the individual; liberation may be from chains, joblessness, drudgery, routine, stupidity, self, or whatever has fettered the human spirit.<sup>9</sup>

Personal Computer. A computer which is small enough to carry and/or sit on a desk, is inexpensive enough to be affordable to many people, can operate as a stand alone system (as opposed to terminals connected to a central processing

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<sup>8</sup>This is the writer's definition gleaned from past experiences, the interviews, and past readings.

<sup>9</sup>The writings of Paulo Freire, Herbert Marcuse, and David Riesman greatly influenced the development of the definition. The concept of locus of control which was originated by Julian Rotter is from E. Thomas Dowd on "The Self and Creativity" in Handbook of Creativity, 235-236.

unit), and can be utilized in a variety of ways by an individual to meet his or her individual needs. The choice of operating totally independently or while connected to another computer is available to the computer user. A personal computer is differentiated for the purposes of this study from the process of "personal computing" which may take place using any type of computer, depending on the interests and capabilities of the computer user.

Playfulness. A quality where there is a sense of leaping for joy, dancing, rejoicing, or gladness. A derivation of the word "pleien" from Medieval English provides the origin of this word. A sense of playfulness is necessary for us to "find the freedom necessary to break out of restrictions ... [and] ... allow[s] experimentation and change." This sense of playfulness is a meaningful attribute for generating that which is "new, original, and unique."<sup>10</sup>

Praxis. "Action and reflection upon the world in order to change it."<sup>11</sup>

Reification. "The process whereby concrete relations between human beings are made to appear as objectified relations between things."<sup>12</sup>

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<sup>10</sup>Joan M. Erikson, Wisdom and the Senses, (New York: W. W. Norton & Company, 1988), 46-47.

<sup>11</sup>Paulo Friere, Pedagogy of the Oppressed (New York: Herder and Herder, 1970), 36.

<sup>12</sup>Giroux, 416.

Rising Expectations. A sense of increasing demands by an individual and on an individual such as: 1) to produce more in less time; 2) to manifest a better quality outcome in appearance; or 3) to require more power, memory, and/or speed in the personal computers or other technological inventions of our environment.<sup>13</sup>

Technophobe. One who fears that technology is taking over our world.<sup>14</sup>

#### SIGNIFICANCE OF THE STUDY

The significance of this study derives from the need for a wider picture of the effects of the use of personal computers on individuals in our society. There has been much criticism of technology, including computers. Concerns have been expressed about dehumanizing effects, technological traps, and control by a computer elite. Several authors also express concern that we need to plan the future uses of computer technology in order to benefit both society and individuals, to provide for the liberating possibilities of the technology.<sup>15</sup> We need to study the phenomena of positive

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<sup>13</sup>A personal definition derived from the writer's own experiences and perceptions as well as expressions of the participants in this study.

<sup>14</sup>The idea presented here derived from conversations between the writer and the advisor for this study while revolving around the dictionary definitions of "-phobe" and "technology."

<sup>15</sup>Roszak, Marcuse, Weizenbaum, and the information technology authors discuss these concerns.



uses and uncover their meanings, when possible. This study was undertaken within the theoretical framework that liberating and creative uses of personal computers are possible.

CHAPTER II  
METHODOLOGY

OVERVIEW

There were a number of phases to implementation of the study: (1) identifying possible participants in the study by using a snowball sampling technique;<sup>1</sup> (2) preparing and sending a preliminary survey to the possible participants who were identified by this sampling in order to select those who met the established criteria; (3) selecting the participants for the interview stage based on the survey results; (4) conducting the interview; (5) accumulating and organizing the data throughout the interview process; (6) analysis of the data accumulated; (7) presenting the data; and (8) offering conclusions and recommendations. The study was approved by the Institutional Review Board of the University for human subject research (see Appendix C). The methodology is that of narrative inquiry where there are stories of experience which characterize the phenomena that occur during the participants' use of personal computers.<sup>2</sup>

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<sup>1</sup>Robert G. Burgess. In the Field: An Introduction to Field Research. (Boston: George Allen & Unwin, 1984), 55.

<sup>2</sup>F. Michael Connelly and D. Jean Clandinin, "Stories of Experience and Narrative Inquiry," in Educational Researcher 19 (1990): 2-14.

## IDENTIFICATION OF PARTICIPANTS

Potential participants who were perceived to use personal computers with enjoyment were located by sending a letter and information form (See Appendix D) in January 1990 to UNCG staff and faculty who were expected to have access to these computer users at the University. They were asked to provide names, addresses, and/or telephone numbers on the information form and return the same in a pre-stamped, pre-addressed envelope. These staff and faculty included all professors who had received C-TEP (Computer-Technology Education Program)<sup>3</sup> grants from the University prior to the study, the Director and several staff members of the Academic Computing Center, the Manager and a staff member of the Microcomputer Center, and several previously identified faculty and staff members who use computers. The letter presented the selection criteria for participants, which were that they should be adults at least twenty years of age and should have demonstrated that they enjoy using personal computers. It also guaranteed confidentiality to any participants.

A total of twenty-nine letters were sent to the faculty and staff members at the University. Of these, seventeen were returned and provided fifty-nine names, one of which could not

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<sup>3</sup>C-TEP grants are for the purposes of developing programs or plans for use of personal computers in the instructional program. Applicants have to prepare a proposal and then report on the implementation if they receive a grant.

be identified as to location. This was a return rate of 58.6%. A data base was developed with pertinent information on all names received. The data base allowed for production of mailing labels and sorting of the information which would be used to select participants for the interview stage.

#### PRELIMINARY SURVEY AND PARTICIPANT SELECTION

A survey (see Appendix E) was then sent to fifty-eight individuals who were identified as a result of the letter sent to UNCG staff and faculty. These individuals were asked to complete the survey and return it in a pre-stamped and pre-addressed envelope by a specified date. In addition, they were asked to complete an attached information form to identify other individuals who might participate in the study. The return of these surveys did provide additional names who, unless they were duplicates, were sent a survey.

A total of seventy-seven surveys were sent in three mailings between February 14, 1990, and March 23, 1990. Forty-four of these were completed for a return rate of 57.1%. In all, there were 101 names obtained from the three mailings. A few individuals were nominated two times and one was nominated three times. The high rate of return as well as the completion of a two-page survey form and the submission of so many names indicated a significant level of interest in this topic.

The following criteria were used to select those participants who would be contacted for the interview stage:

- They had to be at least 20 years of age;
- They had to have used a personal computer for more than six months, but did not necessarily have to own one;
- They had to have used more than one type of software package, e.g., word processing, data base, spreadsheet, game, etc.;
- They had to indicate some degree of excitement or enjoyment in using personal computers;
- They had to indicate some type of positive response to the question regarding how personal computers have affected their lives, the statements applicable to creative uses of personal computer, or the statement about freedom;
- There should be some who use or used IBM or compatible personal computers and some who use or used Apple Corporation personal computers;
- Those who had leisure time activities which involved some creative or aesthetic bent would be selected first;
- Those who indicated that they had developed special or personally satisfying uses for their own personal computers would be selected first.

Possible interview participants were contacted by telephone and the interviews were scheduled at their convenience and at a location of their choice. All were assured that their comments would be held in confidence, that results would be shared, and that the interview should last approximately ninety minutes. Only a very brief explanation of the topic was given over the telephone in order to avoid any mind-set prior to the interview. Each interviewee was

called one to two days prior to the scheduled date for confirmation.

It was decided to interview several people and then determine how many additional interviews were needed. Once no new phenomena or significant differences occurred during the interviews, it was determined that no more would be completed for this study.

#### PARTICIPANTS SELECTED FOR INTERVIEW

There were a total of twenty-two participants selected for interview following study of the forty-four completed survey forms. The following criteria were used to choose which ones would be interviewed, assuming a time that was satisfactory to the participant could be arranged:

- Those individuals who were nominated more than one time;
- Individuals who had written unusual items of information regarding their use of computers or leisure-time activities;
- Individuals from different departments on campus;
- Individuals from different levels on campus, e.g., students, faculty, or staff.

There were so many interesting potential participants that it was difficult to narrow to less than twenty-two from the preliminary survey. In fact, there was another faculty member in the natural science area from whom the researcher desired an interview, however, he was away and would not return until too late for the schedule. In addition, there

were several students who the researcher would have liked to interview, however, several telephone calls failed to reach one and the other was no longer at the University.

Following the first few interviews, it was determined that no more than the twenty-two would be scheduled, even if some had to cancel their appointments and could not reschedule. The time factor for transcribing interviews placed a limitation on how many could be done as well as the last date which could feasibly fit into the research schedule. There was only one cancellation which could not be rescheduled with a faculty member in the natural sciences, though a number of attempts were made to find a time when this individual could be interviewed. This left twenty-one interviews to manage.

The twenty-one interviewees included 11 females and 10 males who ranged in age from 21 to 59 years and represented twelve different departments on campus. There were 15 faculty, 4 staff, and 2 students. The two students were within the first three interviews and it was determined to focus on faculty and staff due partly to access and partly to articulateness in describing their experiences with personal computers.

#### DATA COLLECTION--INTERVIEWS

Twenty-one interviews were conducted between March 6, 1990, and April 4, 1990, most taking place on the UNCG campus

in the faculty or staff person's office or a nearby room. One student came to the researcher's home for the interview--at her own request; another student asked that the interview take place at her apartment. The faculty and staff members all preferred to meet in their own offices or in close proximity to their work area.

Each interviewee willingly signed a Consent Form (see Appendix F) and agreed to tape recording the interview. In all cases and as the interview progressed, they appeared to completely ignore the tape recorder--the only exception being when the tape had to be turned over or changed.

The majority of interviews lasted for approximately one and one-half hours. The shortest was forty-five minutes long and the lengthiest was three hours. A few interviews were limited by other appointments or classes which the interviewee had scheduled as that happened to be around the time for pre-registration student advising.

An attempt was made to begin each interview with an introduction of the researcher, a brief explanation of the topic, and an explanation of the consent form. In several cases, the participants began talking as soon as they knew the identity of the interviewer. Every attempt was made to provide a conversational quality to the interviews and maintain a relaxed atmosphere for the participants. In addition, an effort was made to record details of each participant's physical appearance, particular items such as



glasses, appearance of the office, ideas of decorations and other materials in the office, interruptions which occurred, and any noteworthy gestures or expressions or changes in tone.<sup>4</sup>

All interview tapes were labelled with the code name for the participant, the date on which it took place, the time, and an assigned interview number. A master list was maintained with all this information and the pseudonym for each person.<sup>5</sup>

#### DATA PRESENTATION METHOD

The majority of the data presentation is in Chapter IV, as a narrative account and in thematic form. The "thick descriptions" are relevant for qualitative studies where an attempt is made to give readers a sense of the "informants'" points of view.<sup>6</sup> The sheer volume encompassed by the number

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<sup>4</sup>Ideas were compiled from a number of sources including Adams, Benjamin, Bogdan and Biklen, Gorden, Ives, Marshall and Rossman, and Taylor and Bodgan.

<sup>5</sup>All names used throughout the study are pseudonyms. Most of the participants selected a pseudonym for themselves, however, some of these were too identifiable with the individual. Therefore, arbitrary names were selected for each person to protect their anonymity.

<sup>6</sup>Clifford Geertz, Chapter I "Thick Description: Toward an Interpretive Theory of Culture," The Interpretation of Cultures (New York: Basic Books, 1973), 3-30; Steven J. Taylor and Robert Bogdan, Introduction to Qualitative Research Methods (New York: John Wiley & Sons, 1984), 124; and Robert C. Bogdan and Sari Knopp Biklen, Qualitative Research for Education (Boston: Allyn and Bacon, Inc., 1982), 136-137.

of interviews, the difficulty in understanding many of the tapes due to poor voice transmission with a number of the subjects, and the time limitations of the study prohibited complete transcription of every interview. A representative group of the interviewees was selected for complete transcription, a technique which was recommended in the literature. The remainder of the tapes are available for comparison.<sup>7</sup>

Those selected for complete transcription represented the interviewees who exhibited greater enthusiasm for personal computers or demonstrated unusual experiences during their use and articulated this. Additional factors in deciding on this group included having representation for a variety of personal computers and as many different departments as possible. Therefore, there is a representative who uses an 80386 MS-DOS PC as well as a Zenith; one who uses a Leading Edge and portable PC; one who has an Apple IIGS and uses networking for an extended family as well as an information source; two who use MacIntosh computers but for very different purposes; one who owns an Amiga but also uses mainframes and other PC's routinely; and one who has both an Apple and MS-DOS PC and uses networking for research. In addition, each of these seven represented a different department on campus though

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<sup>7</sup>Bogdan and Biklen, 96.

there are no computer scientists, life scientists, or physical scientists in this group of participants.

The narrative account is organized according to the themes which emerged and which became the category codes used in data analysis. Each major theme is presented with the "collective stories" of this group of seven participants.

#### DATA ANALYSIS METHOD

Geertz said that "analysis ... is sorting out the structures of significance" and that idea was a guiding force in the data analysis.<sup>8</sup> The initial stage of data analysis was begun prior to the interviews. The survey responses were examined for some summary data on the twenty-one participants in the study.

The next stage of data analysis began with transcription of the first several interviews. During the transcriptions, common themes began to emerge and a set of theme codes was developed. Initially there were twenty-one codes used. These codes were entered into the transcripts at the ends of paragraphs to allow for searching and thematic analysis by categories.<sup>9</sup>

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<sup>8</sup>Geertz, 9.

<sup>9</sup>Bogdan and Biklen, 145-169; Ray C. Rist, "On the Application of Ethnographic Inquiry," Journal of Research in Science Teaching 19 (1982): 446; and George W. Noblit and R. Dwight Hare, Meta-Ethnography (Newbury Park, CA: Sage Publications, 1988), 16-64.

As the study progressed, it became apparent that the number of themes needed to be reduced and those that were related were grouped into codes representing a larger classification. Subsequently the categories were reduced to eleven. These categories were used in sorting the transcripts into folders for additional analysis. Each category was then scrutinized and most of these were culled for the preparation of the narrative accounts. The various codes used during these stages of the analytical process are presented in Table 1 on the following page.

There were five major themes which emerged and which will be compared for similarities and differences in the phenomena occurring among the participants in Chapter V. These themes are learning style, rising expectations, playfulness, liberation, and creativity.

TABLE 1  
CATEGORY CODES USED IN INTERPRETATION

<u>FIRST CODES</u>	<u>ABBREVIATION</u>	<u>FINAL CODES</u>
Control	[CONT]	Control
Creativity	[CREA]	Creativity
Large vs Small	[LGvsSM]	Large vs Small
Liberation	[LIB]	Liberation
Miscellaneous	[***]	Miscellaneous
Frustration	[NEG FEEL]	Negative Feelings
Negative	[NEG FEEL]	Negative Feelings
Dislike	[NEG FEEL]	Negative Feelings
Play	[PLAY]	Play
Leisure	[PLAY]	Play
Feel	[POS FEEL]	Positive Feelings
Joy (Enjoyment)	[POS FEEL]	Positive Feelings
Excitement	[POS FEEL]	Positive Feelings
Time	[POS FEEL]	Positive Feelings
Lost	[POS FEEL]	Positive Feelings
Rising Expectations	[RIS EXP]	Rising Expect.
Technology	[TECH]	Technology
Use	[USE INT]	Use, Interests
Interests	[USE INT]	Use, Interests
New	[USE INT]	Use, Interests
Future	[USE INT]	Use, Interests

## CHAPTER III

## THE CREATIVE AND AESTHETIC EXPRESSION OF THE HUMAN SPIRIT

INTRODUCTION

It has been said that "education is a process that must embody the finest elements of what makes us human, that frees us in the process of teaching us what is of value."<sup>1</sup> Yet education has too frequently become schooling, even for adults, partly as a method of retaining the status quo in society. Schools have been designated sites, societal institutions, in which instruction takes place through a banking concept of education. These schools function as a major source of cultural socialization for students of all ages. Students learn to compete, to value rewards and material goods, what constitutes societal expectations, to recognize the meaning of winning and losing, when to speak and when to maintain silence, how to accrue credit and grades, how to be "good," and to differentiate between work and play. During this process, students are classified into the "haves" and "have nots," between "mental and manual labor." The fears now are that personal computers can greatly augment this

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<sup>1</sup>Landon E. Beyer and Michael W. Apple, ed., "Values and Politics in the Curriculum" in The Curriculum: Problems, Politics, and Possibilities (Albany, NY: State University of New York Press, 1988), 6.

occurrence. In essence, they have been dehumanized and are oppressed--what Marcuse terms "preconditioned slaves."<sup>2</sup>

Pinar, Marcuse, Freire, and Jackson are in agreement that change is necessary from the loss of freedom, the stifling of spirit and curiosity. Pinar advocates autonomy whereas Marcuse and Freire view revolution as the only possibility for change. Marcuse's revolution is one of qualitative change with transition to a higher stage of civilization and resulting intellectual freedom and revival of "multi-dimensional language." Freire's revolution is a constituting change to "problem-posing education."<sup>3</sup>

Michael Apple writes of education and power within the context of schooling, technical knowledge and the commodification of culture, and the hidden curriculum and culture. He is concerned about job conditions and the deskilling of the labor force, e.g., word processing technology which reduces labor costs and deskills women workers. In his view, jobs are boring and repetitive, individuals have little control, and the control which is present is centralized. The educational and cultural system assist in the maintenance of the hegemony

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<sup>2</sup>William Pinar, "Sanity Madness, and the School" in Curriculum Theorizing (Berkeley, CA: McCutchan Publishing, 1975), 359-383; Phillip W. Jackson, "The Daily Grind" in Life in Classrooms (New York: Holt, Rinehart, and Winston, 1968), 2-36; Gibson Winter, "Community and Education" in Schools and Meaning, ed. David E. Purpel and H. Svi Shapiro, (New York: University Press of America, 1985; and Marcuse, 40.

<sup>3</sup>Marcuse, 4; and Freire, 67.

of dominant classes.<sup>4</sup> When students accept this factuality of a given world while neither questioning nor tracing the origin, this is reification.<sup>5</sup> Apple does caution educators to focus on the form of pedagogical content and take actions to make changes, thus becoming less mechanistic and reductive.

Gerver also mentions the potential deskilling effects of computers on secretaries who used to balance duties and may now have a manager who simply wants to use the power available through the computer. She is concerned about the apparent gender bias against females and the disappointment of students with introductory courses in a 1984 study. The indications are that this situation is still occurring. In addition, Gerver discusses the advantages and disadvantages of computer technology and concludes that the advantages far outweigh the disadvantages.<sup>6</sup> The issue of external locus of control is relevant to deskilling of certain types of jobs, e.g., secretarial positions. Sineath said that,

.... Word processing at a fundamental level is truly representative of people acting only as information processors, but when viewed as a medium in which ideas and concepts are used to create microworlds of intellectual discourse, i.e., creative aspects of writing the establishment of a

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<sup>4</sup>Michael W. Apple, Education and Power (Boston: Routledge & Kegan Paul, 1982), 4-15 & 143-177.

<sup>5</sup>Giroux, 416.

<sup>6</sup>Elizabeth Gerver, Humanizing Technology (New York: Plenum Press, 1986), 3, 25-27.



supportive relationship between education as liberation and computing is evident.<sup>7</sup>

Streibel describes the poor quality of many microcomputer uses in education, but admits that they do assist in developing a limited "personal intellectual agency" through precise structuring of logical operations. He adds that they need be used appropriately.<sup>8</sup> Martin found that educators were adapting the technology to their delivery system rather than adapting the delivery system to take advantage of the PC's range of capabilities. An example is the teacher using a simple drill and practice exercise which is linear in structure and too frequently boring when the PC could provide a much more interesting learning exercise for the students with the appropriate structure. Martin concluded that PC's do offer the potential to enhance the delivery system.<sup>9</sup> Cumming conducted a year-long study of the implementation of computer programs in a school and found: 1) that the process was slower and created problems in covering the material, so they had to mix traditional methods and the computer programs; and 2)

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<sup>7</sup>Bythel J. Sineath, The Relationship Between Education as Liberation and Computing (ED. D. diss., University of North Carolina at Greensboro, 1986), 96.

<sup>8</sup>Michael J. Streibel, comp., Proceedings of the annual Penn State Microcomputer Information Exchange Conference, (2nd, University Park, PE) 11-12 March 1983, ED 240 978, 260 & 282.

<sup>9</sup>C. Dianne Martin, "School District Implementation of Microcomputers for Instruction," Journal of Research on Computing in Education 21 (Winter '88): 212-228.

there was an advantage in student learning with their developing familiarity, and hence confidence, with the computer. There was too little evidence to determine if there were any changes in higher orders of thinking and learning.<sup>10</sup>

There are reports and manuscripts on the positive side as well. Madian investigated a school where word processing software and PC's are a curriculum design tool which decentralizes the process, thus allowing flexibility and control by the educators over the process. He also considers word processing to be the most flexible program for teaching reading and writing skills. Stories by students in this program were exceptionally well written.<sup>11</sup>

Papert views the essence of the personal computer to be its power to simulate and challenge beliefs about who can learn what things and at what age. In most schools, the computer programs the child. With LOGO, the child programs the computer; the child is in control; the child teaches the computer how to "think." This is a heady experience which he views as turning the child into an epistemologist. He believes that computers will enable modification of learning

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<sup>10</sup>Alister Cumming, "Change, Organization, and Achievement" Journal of Educational Technology Systems 17 (2, 1988-89): 158.

<sup>11</sup>Jon Madian, "New Flexibility in Curriculum Development Through Word Processing." Educational Leadership 43 (March 1986): 23.

environment outside classrooms and allow learning without organized instruction.<sup>12</sup>

Sherry Turkle did an ethnographic study of personal computers, looking at it's "second nature" as an "evocative object" which stimulates thought. She found that, in it's interactions with children, it has an enormous "holding power" and fascination--more than any other form of technology. Turkle is concerned because the "machines are entering into our thinking about ourselves." She presents many interesting stories of children working with personal computers--some inauspicious, some uplifting. She found it a "microcosm for the larger world of relations between gender and science." Turkle is urging us to think about this technology.<sup>13</sup>

Pfaffenberger discusses the uses for microcomputers in qualitative research, along with the capabilities which they provide--similar to the evocative nature presented by Turkle. He cautions against becoming so caught up in what can be done that there is a danger of losing perspective, especially when the computer requires more engagement than the "research" and proposes wise use of personal computers in any situation.<sup>14</sup>

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<sup>12</sup>Seymour Papert. Mindstorms: Children, Computers, and Powerful Ideas (New York: Basic Books, 1980), xiii, 4-5, 9.

<sup>13</sup>Sherry Turkle, The Second Self: Computers and the Human Spirit, (New York: Simon and Schuster, 1984), 13, 16, 24, 118.

<sup>14</sup>Bryan Pfaffenberger, Microcomputer Applications in Qualitative Research, (Newbury Park, CA: Sage Publications, 1988), 20.

As was mentioned previously, action can still be taken, though there are questions as to what this action should be. Laver states that information technology has been used only to quicken and cheapen existing tasks rather than to offer new possibilities. He surmises that since we cannot seem to eliminate alienation, we should at least seek to decrease it. One way of doing this is to involve the people who are directly affected as participants in all phases of the process. He affirms that we have the most powerful means of collecting, analyzing, and manipulating data of all time and wonders why man would create such a splendid technology and then pervert it.<sup>15</sup>

Geiss agrees with much of this. He presents prospects for the future and sample questions for which one might like to know the answers. One question is "what can be done with IT that could not be done otherwise and what new possibilities and opportunities does it offer?" His answer is:

These are some of the most challenging questions in our encyclopedia of ignorance. The answers are bounded primarily by our creativity and insight. The most significant step in human development occurs when we move from using a tool in the way for which it was intended and begin to use it in ways the inventor never foresaw (e.g., computers used as tools for communicating instead of calculating).<sup>16</sup>

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<sup>15</sup>Murray Laver, Information Technology: Agent of Change (New York: Cambridge University Press, 1989), 3, 69, & 175.

<sup>16</sup>Gunther R. Geiss, and Narayan Viswanathan, The Human Edge (New York: The Haworth Press, Inc., 1986), 335.

The message seems to be clear and fairly repetitive. The Computer Revolution or Information Technology Age is upon us and it is time for someone to take action. Adults comprise the single group which can be most likely to effect the most immediate change.<sup>17</sup>

#### EDUCATION AND TECHNOLOGY--THE ADULT EXPERIENCE

Personal computers have the potential for playing a tremendous role in adult or higher education if adult learners accept the use of computers and if the computers are used appropriately. This means only if software fits the needs of the adult learner as to both content of information and use of strategies suited to adult learners and if enough adult learners have access to personal computers. The great advantage of personal computers over larger computers is that of private use within the home where adult learners can study when, where, and what they please (self-directivity). With modems and networking, the capabilities of large computers and their tremendous information facilities are available twenty-four hours a day. The view of personal computers as a source of information for adults offers the chance for changing the primary role of adult education from one of information

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<sup>17</sup>Lukes refers to adults in this manner and is supported by Thomas W. Heaney in "Power, Learning, and 'Compunication'" in David G. Gueulette, ed., Microcomputers for Adult Learning (Chicago: Follett Publishing Company, 1982), 157, who believes that microcomputers can assist in liberatory adult education and in empowering adult learners.

transmission to one of focusing on meaning, problems and issues, ethical concerns, or world issues. Another advantage for adult, or younger, learners is that software can be written for level of difficulty, thus allowing the learners to fit the material to their own personal needs.<sup>18</sup>

In adult education, the emphasis is on humanistic philosophy, interpersonal interaction during the learning process, and the process of problem solving rather than solutions to problems. This presents an issue with the use of instructional technology as many adult educators feel a conflict with humanistic philosophy and technology. Therefore, it behooves the developers of educational software to deal with this fear by providing software that is written from this point of reference. This means considering learning theories other than behaviorism. These learning theories include the following: the cognitive view of Wildman and Burton in which learners use their own experiences to construct meanings and understandings and in which the process is an active and generative one; the information-processing model of Low in which learning events that occur internally are of prime importance; the Proster Theory of Hart in which learning is "brain-compatible" and allows learners to use

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<sup>18</sup>David G. Gueulette, ed., Microcomputers for Adult Learning: Potential and Perils (Chicago: Follett Publishing Company, 1982) citing Jerold W. Apps, "Foreword", xi-xii and David G. Gueulette, "Introduction," 1-9.

their highly individual pattern-detection and pattern-matching system; or other adult learning theories.<sup>19</sup>

The use of personal computers in adult education will be affected by a variety of factors including the instructional methods used, the level of education, the location of educational programs, the reasons for participating in the education program, and the type of educational program. Traditionally, adult learners have preferred methods of instruction consisting of classes, lectures, conferences and institutes, workshops, and on-the-job training. In most instances, information can be presented more quickly by these methods and this fits into the adult learners' schedules and their past learning experiences. However, some adult learners also enjoy independent study and private tutoring. Personal computers offer extraordinary potential for applications in any number of methods of instruction. These types of educational applications could take the form of computer programming and problem-solving drill and practice; drill and practice, with or without remediation; tutorial programs; testing procedures; simulations; resources such as bibliographic searches; and records management. Any of these types of programs could be utilized in either an institutional or home setting. Though many of these do require ability for

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<sup>19</sup>W. C. Meierhenry, "Microcomputers and Adult Education" in Gueulette, 11-27.

extensive "typing," voice-recognition systems in the future will preclude this problem.<sup>20</sup>

In order to be successful, personal computers must be used in meaningful ways in adult curricula. It will not do to attempt the placement of personal computers into every curriculum for every activity. Personal computers should be utilized only in those areas where educational progress will be enhanced and they need be provided only after hardware and software are available that meet curricular needs. Stanley Pogrow refers to a "technologically relevant curriculum" and offers three criteria for appropriate use of technology, specifically personal computers. These are: 1) the extent of direct gains where skills are provided to the majority of students and the system improves educational effectiveness; 2) the extent to which personnel time is saved through automation of certain tasks; and 3) the extent to which costs may be reduced while not impairing learning. Administrative decisions will be made concerning what type of computer will be used, what the computers will be used for, and where the computers will be placed.<sup>21</sup>

Gerver sees a number of advantages for using personal computers in adult education, related to the "fit" between the ways in which adults learn and characteristics of the personal

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<sup>20</sup>Ibid.

<sup>21</sup>Stanley Pogrow, Education in the Computer Age (Beverly Hills: Sage Publications, 1983), 99-135.



computer which support them. These include the limited time that they have available which can be assisted with computer-aided instruction, the immediate feedback, and the attractiveness to certain groups of disadvantaged people. Adults have diverse learning styles and circumstances and computer programs can be adapted to individual differences. Experimentation in areas which are dangerous and highly complex can be accommodated, to a degree, with computer simulations. The personal computer also offers an educative force in encouraging adult learners to seek new training, especially since distance learning is a possibility.<sup>22</sup>

Mackowiak did a study with deaf college students and found relatively positive attitudes toward personal computers, with little gender differences. The latter is somewhat surprising with the other studies which have found distinct gender differences.<sup>23</sup> Flynn conducted a study with 701 economically disadvantaged older adults and found them to be satisfied and enthusiastic computer users. A surprise finding was that women, minorities, and disadvantaged were the most

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<sup>22</sup>Gerver, 10-11, 58-59.

<sup>23</sup>Kate Mackowiak, "Deaf College Students and Computers: The Beneficial Effect of Experience on Attitudes," Journal of Educational Technology Systems 17 (3, 1988-89): 219-229.

committed users. The major anxiety seemed to be on the part of the instructors.<sup>24</sup>

Spruck directed a survey study of faculty in educational administration doctoral programs in over 80 universities to determine how personal computers were being used in these programs and the program requirements relating to this area. The results indicated that the faculty who taught computer applications courses were self-taught and apparently developed this expertise after their appointment to the faculty. This suggests that pre-service training in computer applications was still lacking or unused by the faculty. Another finding was that faculty did not use the computer very frequently, even though most had access--either in a nearby computer laboratory or in their own office. This is an unexpected finding when personal computers are readily accessible. Another problem with the applications courses was that students had varied backgrounds and experiences in computing, therefore content was significantly variable. He suggested that there be a prerequisite of general computer literacy for entry into a computer applications course and presents a proposed outline for such a course.<sup>25</sup>

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<sup>24</sup>Marilyn L. Flynn, "The Potential of Older Adults for Response to Computer-Assisted Instruction," Journal of Educational Technology Systems 17 (3, 1988-89): 231-241.

<sup>25</sup>Dennis W. Spuck and William C. Bozeman, "Training School Administrators in Computer Use," Journal of Research on Computing in Education 21 (Winter'88): 229-239.

Perkins discusses the concerns of some that information processing technology (IPT) may be dehumanizing and narrowing, he presents some cogent arguments for the widespread diversification that is possible. In comparing the mesmerism of television with video games and personal computers, he discusses the possibility of unfortunate seduction of the technologies and determines that there is little to support some of the inordinate concerns. In his view, video games became a serious public issue and then declined, proving the concern of rebellion in the video game parlors to be unfounded. Even though he believes that there is mediocrity and mechanization in toys, software, and other computerized devices, there is primarily an upward trend. Therefore, he believes that the technology trap is essentially nonexistent, primarily due to the diversity of the personal computer. He says that "computers and their associated input/output devices comprise the most flexible symbolic medium ever devised." Perkins believes that they are "potentially applicable to artistic and humanistic endeavors as well as scientific and business enterprise," that they are "adaptable to moderate-sized markets" and represent a "technology for all seasons."<sup>26</sup>

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<sup>26</sup>D. N. Perkins, "The Fingertip Effect: How Information-Processing Technology Shapes Thinking," Educational Researcher 14 (August/September 1985): 11-17.

A great potential of the personal computer in adult learning pertains to information power since adult education has the greatest capacity of all types of education for effecting immediate change. Computerization, which has centralized information power on a large scale, offers a chance for decentralization of information control by providing open access to the public. Lukes discusses three dimensions of power: competition after which the winner receives power while the loser becomes a powerless class; exclusions of certain people from decision making thus weakening opposition and withholding critical knowledge; and elimination of competition by imposing false consciousness. The control of knowledge supports the establishment of the second and third dimensions of power.<sup>27</sup> Computers offer the capacity for tremendous control of knowledge. If computers remain in the hands of a few, then this is domination. On the other hand, computers in the hands of many as a part of liberatory education offers distribution of power and freedom from oppression. Personal computers can neither initiate nor substitute for a social revolution aimed at change.

There are many actual and potential uses of personal computers in adult education. Home computers offer the greatest potential. The sale of personal computers increased dramatically between 1977 and 1984, then began to level off,

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<sup>27</sup>S. Lukes. Power: A Radical View (London: Macmillan, 1974).

even with decreasing costs. With the advent of quality software programs and decrease in computer anxiety, the forecasts of a computer in every home may still be viable. If access to personal computers is adequate, then the potential for adult learning and the distribution of power in the form of knowledge control is tremendously increased.

Roszak said that the sense of power surrounding the computer can be a "deeply illuminating educational moment ... if it comes in the right way...." His powerful caution is that we must fall back on the "one absolute principle in educational philosophy"--never cheapen.<sup>28</sup>

#### LIBERATION AS A HUMAN NEED, OR RIGHT

Michael Crichton says that "one of the delights of any new technology is that it is, for a while, free." This is before government, businessmen, or educators have learned how to control it.<sup>29</sup> John Henry Martin remarks that "...the manner in which the technology has been used by the schools has predestined it to perform only a minor and subordinated role." Programs such as IBM's "Writing to Read" illustrate the design which is compatible with the intellectual scheme that is fundamental to the task. Creative software needs

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<sup>28</sup>Theodore Roszak, The Cult of Information (New York: Pantheon Books, 1986), 66, 86.

<sup>29</sup>Michael Crichton, Electronic Life: How to Think About Computers (New York: Alfred A. Knopf, 1983), 28.

follow this path and additionally provide for different types of learners. Martin looks forward to the possibilities in the future.<sup>30</sup>

Crichton also questions whether personal computers make a difference in an author's writing, though there is a cleaner copy and it is faster. Whether there is any profound effect on writing depends on the individual. He believes there may be simply a new technology effect for about six months.<sup>31</sup> O'Looney, et al, discusses cognition and writing within the concepts of creativity and a 1984 study by Rose concerning "high-blockers" versus "low-blockers." In this study, Rose found that "high-blockers" generally assume that the process of writing is spontaneous and therefore have a problem when the ideas do not flow. These writers generally do not plan their writing with outlines due to this idea of flow and have rather rigid rules about their writing. "Low-Blockers" have flexible rules, plans to implement, and goals to produce.<sup>32</sup>

Maxine Greene elucidates that "Only through education can individuals be liberated for independent and critical thinking, to create meanings for themselves." It is one of the teacher's tasks to free those who can be reached to

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<sup>30</sup>John Henry Martin, "Developing More Powerful Educational Software," Educational Leadership 43 (March 1986): 33.

<sup>31</sup>Crichton, 113.

<sup>32</sup>John A. O'Looney, et al "Cognition and Writing," Chapter 18 in Glover, 309-310.

liberate themselves.<sup>33</sup> Sineath expressed additional concerns regarding when computers become common to our everyday life as to whether "educators are even searching for answers, much less planning curriculum which addressed basic philosophical questions." He wonders whether there will be expansion of our individual freedom or clandestine enhancement of controls over our lives. He adds:

Education is related to dreams and therefore culture. Computers are part of our culture as is the struggle for freedom. Within the field of education there also exist individuals who share the struggle for freedom.

Liberation within the context of education means that individuals empower themselves to 'take charge' of their lives and their world.... it entails becoming empowered to create the world in which one exists.

Some people utilize study of the computer to take charge of their lives. This is a "congruent and supportive aspect of the relationship between computing and education for liberation."<sup>34</sup>

David Riesman examined "the average middle-class American through the round of his or her work, play, and politics." In the process, he defined autonomous people to be:

...those who on the whole are capable of conforming to the behavioral norms of their society--a

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<sup>33</sup>Maxine Greene, Teacher as Stranger, (Belmont, CA: Wadsworth Publishing Company, Inc., 1973), 4, 60.

<sup>34</sup>Sineath, 13-14, 40, 70.

capacity the anomics usually lack--but who are free to choose whether to conform or not.<sup>35</sup>

In a later study, Riesman looked at the "faces" of some twenty individuals, with data obtained through interviews and focusing on the details of their lives, attempting to "reconstruct a living person." In this study, he refined his definition of an autonomous person.

"The autonomous person ... can exercise some choice over the structuring of his experience; if he conforms it is not compulsively, and if he deviates it is not unknowingly.... it is his inner reactions and his potentialities for future actions which are crucial...."<sup>36</sup>

Freire perceives liberation as constituting the change to "problem-posing education" where there are "acts of cognition, not transferrals of information" and where "men teach each other, mediated by the world, by the cognizable objects which in banking education are 'owned' by the teacher."<sup>37</sup> The teacher and student become critical co-investigators--in dialogue. There is a constant unveiling of reality and authentic reflection, that of man in relation to the world. This is education, truly, which effects the development of

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<sup>35</sup>David Riesman, The Lonely Crowd, in collaboration with Ruel Denney and Nathan Glazer, (New Haven: Yale University Press, 1950), 288.

<sup>36</sup>David Riesman, Faces in the Crowd, in collaboration with Nathan Glazer, (New Haven: Yale University Press, 1952), 326-327.

<sup>37</sup>Freire, 67.



critical awareness and critical thinking. This liberation is an ultimate process of humanization. As Freire says:

For apart from inquiry, apart from the praxis, men cannot be truly human.... only through communication can human life hold meaning.... But one does not liberate men by alienating them.... Liberation--the process of humanization--.... is a praxis: the action and reflection of men upon their world in order to transform it.... Those truly committed to liberation must ... [adopt] ... a concept of men as conscious beings, and consciousness as consciousness intent upon the world.... Authentic reflection considers neither abstract man nor the world without men, but men in their relations with the world. In these relations consciousness and world are simultaneous: consciousness neither precedes the world nor follows it.... Problem-posing education affirms men as beings in the process of becoming - as unfinished, uncompleted beings in and with a likewise unfinished reality.... Education is thus constantly remade in the praxis. In order to be, it must become.... Problem-posing education is revolutionary futurity. Hence it is prophetic (and, as such, hopeful).<sup>38</sup>

Is technological progress, especially computer technology, part of an increasing domination or increasing liberation, especially as applicable to adults? It would seem that it depends on where one is in relationship to being "individuated" or "centered" or "more fully human." The writings of a variety of authors indicate that personal computers provide liberation for some and domination for others--in both an educational sense and a physical or mental

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<sup>38</sup>Ibid., 58-72.

sense.<sup>39</sup> Though ultimately concerned about technology and its uses, Herbert Marcuse is still emphatic that "... the power of the machine is only the stored-up and projected power of man" and that "it becomes the potential basis of a new freedom for man." He sees automation as "technical instrument of the turn from quantity to quality" which will allow real free time for human beings if these instruments are used for the "pacification of the struggle for existence." In such a case, humans would be free for the "art of living."<sup>40</sup>

After personal computer sales stalled in 1984, Steven Jobs--one of the inventors of the Apple computer--came to the conclusion that the home market had been overestimated and he decided that the future of the technology lay in offices and schools. According to Theodore Roszak, this was a dramatic change of course for the technology where something important was lost. He laments that:

... The ideal of an electronic populism based on the near-universal distribution of personal computers had faded. Apple Computers, the champion of the cause, found its hard-won commercial territory under attack ... by the indomitable IBM.... The technology was reverting to its original colossalism.<sup>41</sup>

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<sup>39</sup>The writings of Herbert Marcuse, Paulo Freire, Joseph Weizenbaum, Seymour Papert, Sherry Turkle, and Tracy Kidder discuss this in detail.

<sup>40</sup>Marcuse, 36, 227.

<sup>41</sup>Roszak, 1986, 155.

Roszak views the next possible worthwhile exploration to be that of networking. He regards it as being similar to citizen-band radio, yet still a unique form of communication since,

There is no other way in which a great number of people over an area as large as the world's telephone system can exchange ideas in so unstructured a way at all hours of the day and night, and even preserve a transcript in the form of hard copy. The mode of discourse--words typed on to a video screen--may be an awkward substitute for face-to-face conversation, but, strangely enough, there are those who find the anonymity of the medium peculiarly attractive. Supposedly, the impersonality which personal computers make possible to networkers has a liberating and leveling effect; it blanks out race, age, gender, looks, timidity, and handicaps and encourages frankness.<sup>42</sup>

Yet Roszak is appropriately concerned that this technology may fall into totalitarian hands and be molded to suit the purposes of larger forces such as the military and large industry. He regards the computer as uniquely lending itself too conveniently for such practices through its ability to concentrate and control information, applications which dwarf the hopes of those who wish more democratic uses and which might seriously endanger our freedom and survival.<sup>43</sup> He also concludes that the scale of things is an independent problem of our social life--that "scale is a matter of

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<sup>42</sup>Ibid., 169.

<sup>43</sup>Ibid., 179-181.

quality, the quality of life and of human relations that results from our collective action in the world" and that anything which "dwarfs us into unbecoming dependence or diminishes our personal dignity is too big."<sup>44</sup>

A significant disquiet exists that we will do nothing to retain this "human-scale technology." Schumacher proposed this concept and its inherent values in Good Work, where he defines intermediate technology as that "by which small people can make themselves productive and relatively independent." He means a technology whereby their work could be good as it was engaging the "vertical dimension" of life. In this instance, work provides an expression of value and offers the place where "our temporal and spiritual dimensions converge to create acts in the world."<sup>45</sup> This book was an addition to his Small is Beautiful, where he said that "small is beautiful" but asserts that he could have said that "small is free, efficient, creative, enjoyable, enduring."<sup>46</sup> Lipnack and Stamps said that "Networks are appropriate sociology--the human equivalent of appropriate technology...."<sup>47</sup> Personal

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<sup>44</sup>Theodore Roszak, Person/Planet (Garden City, NY: Anchor Press/Doubleday, 1978), 36.

<sup>45</sup>E. F. Schumacher, Good Work, (New York: Harper & Row Publishers, 1979), 23, 43, 215-6.

<sup>46</sup>E. F. Schumacher, Small is Beautiful: Economics as if People Mattered, (New York: Harper & Row, Publishers, 1973), 4.

<sup>47</sup>Jessica Lipnack and Jeffrey Stamps in John Naisbitt, Megatrends (New York: Warner Books, 1984), 215.

computers offer us many opportunities. If we do nothing to preserve its "human-size," then that is reification, or accepting the factuality of a given world without questioning or tracing the origin of the control.

Lipnack and Stamps have been involved in networking since its beginning. Networking is one of the areas which frightens those who fear the power of the computer. They still consider it a human-size technology and call all networking, "people connecting with people." In computer networks, they see two components: the parts--that are made up of all the people, software, and hardware and have independent functions and capabilities; and the whole--that is formed with the communication between the parts. They say that "computers enhance our humanness" and we are only at the beginning.<sup>48</sup>

James MacDonald, who wrote from a reconceptualist framework and a transcendental ideology, had this to say:

.... we have entered a new hierarchical level with our electronic world.... a cultural milieu that has never existed before.

The sense of powerlessness and impotence we feel is not a sign of alienation in the traditional Marxian sense.... It is a true reflection of the state of the human beings to the extent that we transfer psychological states grounded in a premodern society.... we are indeed powerless when we consider our destructive nuclear capacity and our dependence upon computers and power sources.... I see the present and future technological domination of man as a step in the road toward

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<sup>48</sup>Jessica Lipnack and Jeffrey Stamps, The Networking Book: People Connecting With People (New York: Routledge & Kegan Paul, 1986), 98-99.

human evolution. It is my personal myth that today's technology is yesterday's magic. Further, it is my intuitive feeling that technology is in effect an externalization of the hidden consciousness of human potential. Technology, . . . , is a necessary development for human beings in that it is the means of externalizing the potential that lies within. Humanity will eventually transcend technology by turning inward, the only viable alternative that allows a human being to continue to experience oneself in the world as a creative and vital element. Out of this will come the rediscovery of human potential.<sup>49</sup>

MacDonald had confidence that humans will ultimately transcend the domination of technology and turn inward. Marcuse thinks that we will ultimately have to examine ourselves more fully. He has trust that humans have the power to either be dominated by technology or transcend it and ultimately become more fully human because of the free time available for enriching activities.

Most of us are concerned with the compelling attractions of computers. Yet humans have always been compelled by various activities. Csikszentmihalyi writes of the flow state that is achieved by people who play chess, play basketball, climb mountains, do rock dancing, and perform surgery. For some, the flow state becomes almost metaphysical.<sup>50</sup> The feelings his subjects describe are often the same as those

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<sup>49</sup>James B. MacDonald, "A Transcendental Developmental Ideology of Education" in James R. Guess and David E. Purpel, ed., Curriculum: An Introduction to the Field (Berkeley: McCutchan Publishing Company, 1978), 100-101.

<sup>50</sup>Mihaly Csikszentmihalyi, Beyond Boredom and Anxiety (San Francisco: Jossey-Bass Publishers, 1975).

related by Kidder in The Soul of a New Machine. Some of the programmers refer to "the golden moment"--which comes rarely enough--"when the scales fall from a designer's eyes and a problem's right solution is suddenly there." When asked why he wore himself to extreme thinness, Tom West who was the project leader said,

There's a big high in here somewhere for me that I don't fully understand. Some of it's a raw power trip.... I'm sitting here burning myself up and doing it because I like it. You wouldn't have to pay me very much to do this....

Among those who chucked the established ways, including me, there's something awfully compelling about this. Some notion of insecurity and challenge, or where the edges are, of finding out what you can't do, all within a perfectly justifiable scenario. It's for the kind of guy who likes to climb up mountains.<sup>51</sup>

In fact, some of the engineers in West's project had begun rock climbing. Another related example includes the feelings described by people who run marathons and those who reach an "emotional high" while running.

Weizenbaum compares compulsive programmers to compulsive gamblers and differentiates these compulsive programmers from professional programmers. The compulsive programmers eat and sleep by their computers, are "superb technicians," and "knows every detail of the computer." They do not document their programs and are the only ones who know their programs; their

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<sup>51</sup>Tracy Kidder, The Soul of a New Machine (New York: Avon Books, 1981).

programming is a chance for them to interact with the computer. They have a low tolerance for being separated from their computers and view themselves as in control over the computers. The professional programmers, on the other hand, address the problems, do lengthy preparatory work, and develop programs slowly and systematically.<sup>52</sup> It remains true that some people are caught up in certain activities while others do not even like the activity or can "take it or leave it."

Apple in Beyer & Apple has an apprehension with the "coupling of school and home markets" which he feels will further disadvantage groups of students. Class, race, and gender barriers will be maintained.<sup>53</sup> Bork disagrees with this view as he contends that this should not be a problem, that a joint Federal and State plan could develop access for everyone; he does not elaborate.<sup>54</sup>

Many authors have expressed concerns about personal computers--either their evocative nature or the technophobia which is still prevalent, especially in some groups. Asimov concluded that the reasons for technophobia were fear of job loss, appreciation of risks which coexist with changes in

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<sup>52</sup>Joseph Weizenbaum, Computer Power and Human Reason (San Francisco: W. H. Freeman and Company, 1976), 117.

<sup>53</sup>Apple, in Beyer and Apple, 302-305.

<sup>54</sup>Alfred Bork, "Ethical Issues Associated with the Use of Interactive Technology in Learning Environments," Journal of Research on Computing in Education 21 (Winter '88): 121-128.



technology, and a subtle fear of those involved in technological careers for re-education and relearning.<sup>55</sup>

Pirsig considers the effects, perceptions, and relationships of technology with humans. He says that things are faster and broader in this technological time--including the stream of national consciousness. He believes that people who fear technology have an attitude that is self-defeating and is, in fact, ingratitude as they most likely could not survive without technology. He contemplates the spectator attitudes of people toward machines and says that "there is no manual that deals with the real business of motorcycle maintenance, the most important aspect of all." He urges that we consider the relation of ourselves to machines as "the art of the work is just as dependent upon your own mind and spirit as it is upon the material of the machine." He believes that "this divorce of art from technology is completely unnatural" and that "it's just that it's gone on so long you have to be an archeologist to find out where the two separated." He urges caution but a re-evaluation of our relation with technology.<sup>56</sup>

Several other authors gave their ideas for the future of this technology. Evans believes that the growing demand will

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<sup>55</sup>Isaac Asimov, The Roving Mind (Buffalo, NY: Prometheus Books, 1983), 84.

<sup>56</sup>Robert M. Pirsig, Zen and the Art of Motorcycle Maintenance (New York: Bantam Books, 1974), 7, 16, 24-25, 41, 147-148.

be fueled for some time since we have already reached the point where computers are necessary. He predicts a focus of attention turning to the home, which will become the "major center of work and leisure activity," the "private universe to escape the buffets of the world."<sup>57</sup> Shepard believes that the "drudgery of work will be eliminated, productivity will meet the total needs of man, and the enrichment of life can be pursued"--echoes of Marcuse's hopes.<sup>58</sup>

Naisbitt foresaw the beginnings of a "mammoth communication revolution" and that the restructuring of America from an industrial to an information society will be as profound a change as the Industrial Revolution, but will occur much quicker. The human side is that workers who create, process, and distribute information will have the option of deciding where they will work--at home or the office. However, he doubts that many people will want to work at home. He refers to the computer as "Liberator" in a high-tech/high-touch sense where computers can keep track of records and free management to provide "cafeterias of compensations."<sup>59</sup>

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<sup>57</sup>Christopher Richie Evans, The Micro Millenium (New York: Viking Press, 1980), 11-68, 152- 218-219.

<sup>58</sup>Nolan E. Shepard, "Technology: Messiah or Monster," in Walter M. Matthews, ed., Monster or Messiah? The Computer's Impact on Society (Jackson, MI: University Press of Mississippi, 1980), 145-155.

<sup>59</sup>Naisbitt, 16, 9, 33, 39.

Naisbitt also says that "By discovering our potential as human beings we participate in the evolution of the human race" and we "develop the inner knowledge, the wisdom ... required to guide our exploration of technology." There is a need for balance between the physical and spiritual reality.<sup>60</sup>

Ira Shor and Paulo Freire collaborated on a "talking book" that considers "liberating" or transformative education, without considering technology. However, the concepts apply in any educative situation. Where Freire uses the term "liberating," Shor uses "liberatory" in referring to the pedagogy; they use both terms equally. The book is a dialogue, which they say is in itself "creative and re-creative." In this book, they discuss that education does have a directive nature in that a teacher has a plan, program, or goal, but they differentiate between the "directive liberating educator" and the "directive domesticating educator." The liberating educator moves toward an atmosphere of "comradery" where there is dialogue and the differences between the educator and the students are not antagonistic. This liberating difference is a "tension" to be overcome with a democratic attitude. They also say that "a liberating educator challenges people to know their actual freedom, their real power," while recognizing that there is a fear of

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<sup>60</sup>Naisbitt, 52.

freedom. Freire also says that a liberating educator will not do enough to change the world, however, he or she can begin to "make some good contributions."<sup>61</sup>

#### CREATIVITY AND AESTHETICS

Historically, the concept of creativity embraced only artistic endeavors such as painting, artistic drawing, music composition, dance choreography, and other activities usually referred to as "art." Plato attributed creativity to supernaturalism and rejected any rational explanation. Aristotle proposed two ultimate and universal principles relevant to the subject, those of naturalism and rationalism. Freud placed emphasis on fantasy and unconscious processes. Following the naturalistic tradition, Galton advocated a genetic explanation, that humans inherited their creative abilities. Later, Kant stated that creativity was self-determining and had unpredictable aspects. Then, in the twentieth century, there has been a progressive transition from a focus on description of creative activities to a greater focus on an explanation of creative acts.<sup>62</sup>

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<sup>61</sup>Ira Shor and Paulo Freire, A Pedagogy for Liberation (South Hadley, MA: Bergin & Gervy Publishers, Inc., 1987), 1, 3, 172-173,

<sup>62</sup>Albert Rothenberg and Carl R. Hausman, The Creativity Question (Durham, N.C.: The Duke University Press, 1976), Chapter I.

A number of authors have described their perception of discernible stages within the creative process. These stages are presented purely for the purpose of discussion, recognizing that there are several schools of thought on this subject and that these stages may be neither distinct nor progressive. It is also possible that one may be spiraling from any phase to another in a given activity and there may also be any number of creative activities in process at one time. Therefore, one may be flowing back and forth among these activities and within the process for any single endeavor. This idea is supported in the summary article in The Nature of Creativity where Tardif and Sternberg say that

... both within a domain and within the same individual at different points in time, there may be differences with respect to the amount of creative processing in which individuals engage.<sup>63</sup>

Several traditional works which have become standards on creativity have advanced the following stages as being present in most creative endeavors:<sup>64</sup>

1. The first stage is one of preparation which consists of investigation in all directions around a particular creative activity, for example, painting or writing a book.

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<sup>63</sup>T. Z. Tardif and R. J. Sternberg, "What Do We Know About Creativity?" in Robert J. Sternberg, ed., The Nature of Creativity (New York: Cambridge University Press, 1988), 431.

<sup>64</sup>Rothenberg and Hausman; and Brewster Ghiselin, The Creative Process. (New York: Plenum Press, 1986).

2. The second stage is that of incubation or interlude. This is an unconscious stage during which a model or idea involuntarily repeats itself with more or less modification during a period when the "artist" is also thinking of other topics. This subconscious or "unconscious" thought may allow for depth and enrichment.

3. The third stage is that of illumination, "flash of insight," or the "aha moment"--what the Japanese call "satori" or flash of enlightenment. For some this stage is sudden, comes in a flash and almost fully formed, and has certitude--a certain knowledge that the idea is right for the "artist" and the medium. For others, it may not be sudden, may even take years to happen as a complete illumination.

4. The fourth stage is that of verification, critical testing, or reconstruction. Possible additional terms include polishing, elaboration, or enrichment. In some areas, this fourth stage involves testing of the validity of an idea and reduction of the idea to exact form as in creation of mathematical formulas or scientific theory. In other areas, this stage requires additions or changes to the original idea in order to achieve balance or the best effect, as in painting or music.

According to Dean Keith Simonton, the preceding discussion applies to only one "p" of creativity--process. He theorizes that there are four distinct categories for defining creativity, and calls them the "four p's" of creativity

research. The first is creativity as a process which is the orientation of Ghiselin's The Creative Process and Koestler's The Act of Creation and is oriented to the four stages presented above. The second is focused on the creative product, which expresses that the process should result in some product that is both "original" and "adaptive." This emphasis is presented by such researchers in empirical aesthetics as Martindale, Amabile, and Simonton himself. The third is the conception of creativity as applicable to the person, the idea of the personality psychologists such as Barron and Harrington. In this realm of research, they study what makes one individual creative as opposed to another. The fourth is focused on creativity as an act of persuasion, where individuals can only be considered creative after they impress others. Consequently, there is an interpersonal or social phenomenon at work and the creativity "emerges as a particular type of leadership." This view is preferred by some social psychologists and by most sociologists and anthropologists such as Albert, Amabile, Simonton, and Sternberg. Simonton admits that in reality this is not always ideal nor does the creative process always result in a creative product. He prefers to select the definition of creativity as persuasion and subordinate the others. He adheres to two fundamental propositions about the nature of creativity: 1) that creativity is a form of leadership which includes personal influence over others and 2) that it comprises the

participation of chance processes, whether in the origination of new ideas or in the social acceptance of the ideas.<sup>65</sup>

Suchodolski and Kuczynski discuss creativity as a practical philosophy and, in the process, provide several definitions of creativity and a discussion of how it has changed. They consider the early ideas of creativity as applicable to art and move to the concept of scientific creativity as the first break from this image. They add that we no longer pause at comparing technological invention to artistic and scientific creativity and discuss creativity in the context of professional work and "creative management of institutions," which is related to "average people."

The usage of the word 'creativity' leads towards the description of an active, not passive, attitude to social life and culture. A creative attitude to reality expresses a specific type of commitment and innovative activity.....

The introduction of the creative element into man's life changes it distinctly. It loosens its recent form, takes it away from accepted traditions, directs it into novelty... It teaches us to begin our lives 'from the start', again and again....

Creativity gives us the feeling of the fullness of life through the connection of a rich internal experience with the possibility of richness in the world created by human activity.<sup>66</sup>

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<sup>65</sup>Dean Keith Simonton, "Creativity, Leadership, and Chance," in Sternberg, 386-388.

<sup>66</sup>Bogdan Suchodolski and Janusz Kuczynski, "Permanent Education and Creativity," Paper presented to the United Nations Educational, Scientific, and Cultural Organization, Paris, France, January, 1982, ED231941, 79, 81, 84-85.



Suchodolski and Kuczynski are speaking of creativity as a philosophy and as it relates to permanent education. They are also referring to a change in viewpoint towards creativity and, in addition, the effects of technology. In fact, they "cherish more hope than we did before that technological progress will permit an increase in the creative elements of human labour." Nevertheless, they also recognize that this may not affect mass society. Suchodolski and Kuczynski do believe that "civilization is at a crossroads" and that education has certain tasks: 1) shaping critical consciousness; 2) teaching alternative (and evaluative) thinking; 3) concern for quality of life and a principle of life that is "to be" rather than "to have;" and 4) teaching the principle of action in creation and work. In their final discussion, creativity is defined as

"establishing a new relationship between man and ... object[s] ... as the outcome, the summit of man's possibilities and his axiological-cognitive activity."<sup>67</sup>

Suchodolski and Kuczynski also believe that "Freedom is ... necessary for the act of creation" and "creativity is an individual activity."<sup>68</sup> This is reiterated by Anthony Storr. Storr deduces that what happens when one is alone is just as important as what happens during interactions with others.

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<sup>67</sup>Ibid., 98, 39, 226.

<sup>68</sup>Ibid., 79.

The creative person's most significant moments almost always occur during solitude. Storr theorizes that it is the discrepancy between man's inner world of the imagination and the world of external reality which motivates creative imagination. He also says that "creativity usually consists of forming new links between formerly disparate entities."<sup>69</sup> Pinar says that, "often it is only in solitude that one's personal reality can be preserved,..."<sup>70</sup> Therefore, solitude or aloneness seems to be an accepted part of creativity.

There is a great diversity among authors as to the nature of creativity. Tardif and Sternberg summarize their collection of sixteen works on the subject by comparing how all the theories are related or in agreement. All agree that creativity takes a lot of time, that insight and its flashes set off creative thinking, that the processes are very closely tied to their products, and that different levels of creative expression may occur across distinct domains. There is controversy over whether creativity is available to a few or to all individuals, whether creativity must produce uniqueness or whether multiples may occur, and the accessibility of these processes within individuals. They say that consensus has yet to be reached on the total picture, but the fact that accord

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<sup>69</sup>Anthony Storr, Solitude: A Return to the Self, (New York: The Free Press, 1988), xiv, 69, 198.

<sup>70</sup>Pinar, 377.

has been achieved in any aspect is an "exciting possibility" requiring much "empirical research."<sup>71</sup>

Perkins believes that creativity is more a style, a way of deploying one's abilities rather than an ability in itself and this relates to personality.<sup>72</sup> David Purpel expresses his thought that:

Creativity is not an exotic and mysterious quality but rather an inevitable and inherent aspect of human experiences. All people constantly create: we create meaning, we create our responses to nature and culture, we create culture....<sup>73</sup>

According to Erikson, "Creativity involves generating that which is new, original, unique." She says that "the idea, the conception, is a gift of the imagination" and that the process is "the disciplined work of manifesting that conception, uniquely and with integrity." The result is the "development of the prescribed form" which may be an object, such as a painting, or one's own autobiography, meaning one's life. It is her view that we frequently live in "molds, tight grooves," making it difficult to generate anything unique. She feels that in order to "find the freedom necessary to

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<sup>71</sup>Tardif and Sternberg, 431-433.

<sup>72</sup>David Perkins, "On Creativity and Thinking Skills: A Conversation with David Perkins," Educational Leadership 43 (May 1986): 16.

<sup>73</sup>David E. Purpel, The Moral and Spiritual Crisis in Education, (Granby, MA: Bergin & Garvey Publishers, Inc., 1989), 134.

break out of these restrictions we need a sense of playfulness which allows experimentation and change." The most fundamental prerequisite is self-actuated playfulness. "Coercion freezes the impulse to improvise spontaneously...."<sup>74</sup>

Paul Torrance was influenced by Japanese concepts of creativity--those of "satori"--which have some of the real essence of creativity that has been missing from the thinking of writers in other countries. He writes:

To attain expertness in any worthwhile skill, the Japanese commonly expect that it will require many years of intensive training and practice. They regard short cuts as harmful. In 'expertness,' the highest point attainable is 'satori,' a sudden flash of enlightenment. The attainment of 'satori' involves many things. It requires intense devotion. One must be 'in love with' something. It requires constant practice of even very simple operations over a long period of time. It requires concentration and absorption to the exclusion of other things. Generally it involves an intensive, long-term, one-to-one relationship to a 'sensei' (teacher). Above all, it requires persistence--hard work, self-discipline, diligence, energy, effort, competence, expertness.<sup>75</sup>

The relationship of creativity to personality is a matter which has been studied for some time. Lawrence believes that there are certain factors evident in a creative personality--

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<sup>74</sup>Erikson, 65, 68, 46-47, & 49.

<sup>75</sup>Paul Torrance, The Search for Satori & Creativity. (Buffalo, NY: The Creative Education Foundation, Inc., 1979), ix.

including interests, motivation (as inquisitiveness), values, flexibility (as in open mind), sensitivity, and imagination. He feels that motivation, as the urge to acquire knowledge, is perhaps the most important element in a creative person's personality. In addition, he believes that creativity is fostered when one's imagination is allowed full expression without external or internal restrictions and when the individual uses internal criteria for judgment and evaluation of personal satisfaction following any creative activity. That is when it becomes a reflection of the person and can be truly called his or her own, especially since a creation may arise from either a vocation, avocation, conflict, or observed need which resonates with one's individual personality.<sup>76</sup>

Previous theses also contributed the idea that a person's early attitudes, developed in the home, have a prominent effect on choice of career and how stimulating this alternative may be for creative pursuits. Interests must be allowed to develop early in life in order to maintain creativity, meaning that an individual who is not allowed to develop creative attitudes will not choose creative activities later in life. Therefore the world "loses this potentiality" as there are personality factors which are strongly affected by environment and need nurturing during the development stage. Lawrence believes that it is ultimately the inner

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<sup>76</sup>James Lawrence in Rothenberg and Hausman, 115-122, 130.

drive which makes the difference in that the creative person must have "the hunger" to be creative--essentially to have the persistence required for Torrance's "satori."<sup>77</sup>

Howard Gardner emphatically supports the idea of early intervention and consistent training in developing an individual's ultimate level of performance after observing students at the Suzuki Talent Education center in Matsumoto, Japan, where students reach amazing levels of achievement. He says that,

.... if a particular behavior is considered important by a culture, if considerable resources are devoted to it, if the individual himself is motivated to achieve in that area, and if proper means of crystallizing and learning are made available, nearly every normal individual can attain impressive competence in an intellectual or a symbolic domain.<sup>78</sup>

He continues with the idea that there is always a dialectic at work between these roles and functions which are valued by any culture and the intellectual skills of the individuals. It is therefore the purpose of the marketplace or personnel director to match these roles to the specific individuals; perhaps better yet, society can allow each individual to develop his or her fullest potential and choose the most personally desirable role from a variety of possibilities. This is

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<sup>77</sup>Ibid., 133; and Rothenberg and Hausman, 249.

<sup>78</sup>Howard Gardner, Frames of Mind (New York: Basic Books, Inc., Publishers, 1983), 316.

Gardner's "developed sense of self," the highest achievement of human beings, or Roszak's "Manifesto of the Person" where each person longs to discover an authentic vocation and to find the work and way in the world belonging uniquely to each individual.<sup>79</sup>

E. Thomas Dowd considers the self and creativity and includes ideas and results of a number of studies on fostering creativity. He particularly emphasizes one study which compared 208 first through fifth graders in physical education classes where half were in teacher-dominated classes and half were in shared decision-making groups. Those in the shared decision-making group had higher positive attitude scores and significantly higher scores on tests of creativity, motor skills, and self-concept. They therefore encourage the use of participatory classes between teachers and students. In addition, they recognize that there are occasional instances when we must purposefully discard rules to allow a new channelling of thought. Several other ideas for fostering creativity include meditation, use of humor to allow for distancing, and learning from our mistakes. Another notable concept for advancing creativity is to engage in "appropriate leisure activities" which can enhance creativity. The reasons include the capabilities of leisure activities for exploratory, divergent, and creative activities and a

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<sup>79</sup>Ibid., 316, 242; and Roszak, 1978, 4.

"heightened sense of self-expression and autonomous control."<sup>80</sup>

Tardif and Sternberg also discuss the creative person and state that there are three general categories consisting of "cognitive characteristics," "personality and motivational qualities," and "special events or experiences during one's development." A number of researchers agree that people are creative within certain domains and not others, however creative people share certain traits. Three sets of cognitive characteristics that creative people appear to share include traits, abilities, and processing styles. The traits that are attributed to creative individuals consist of relatively high intelligence, originality, articulateness and verbal fluency, and a good imagination. The cognitive abilities are the following: facility to think metaphorically, flexibility and skill in decision making, independence, talent in coping with new things, logical thinking skills, aptitude for internal visualization, capability of not getting caught in old ways of thinking, and in finding the order in chaos. Finally, these creative people are distinguished by the way in which they approach problems--their processing styles. These styles may include wide visions, nonverbal communication, building of new structures, questioning the norms, being open to new things,

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<sup>80</sup>E. Thomas Dowd, "The Self and Creativity," in John A. Glover, Royce R. Ronning, and Cecil R. Reynolds, ed., Handbook of Creativity (New York: Plenum Press, 1989), 239-240.



recognizing areas of knowledge gap, and employing existing knowledge as a base for new ideas.<sup>81</sup>

Tardif and Sternberg find one characteristic which seems to predominate within creative people, and that is an almost "aesthetic ability that allows such individuals to recognize 'good' problems in their field and apply themselves to these problems while ignoring others." They assert that this is worthy of greater study to determine whether this is a combination of other characteristics, is due to personality or motivational characteristics, or is something else altogether. They include the scientific areas in this sense, where aesthetics are not usually thought to be important. At least, when investigated in depth, they believe that this will become apparent.<sup>82</sup>

In addition, they examine the characteristics that are found in creative people which include a willingness to take risks, perseverance, curiosity, openness to experience and growth, absorption, discipline and commitment to work, intrinsic motivation, task-focusing, freedom of spirit that rejects other-imposed limits, self-organization and setting of own rules, and need for competence. Others also believe creative people to be withdrawn, reflective, internally occupied and to have impact on others. Tardif and Sternberg

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<sup>81</sup>Tardif and Sternberg, 434-435.

<sup>82</sup>Ibid., 435.

summarize the developmental histories of creative people, based upon the writings of all authors represented in their work. They describe these as:

Being a firstborn, having survived the loss of one or both parents early in life, experiencing unusual situations, being reared in a diversified, enriching, and stimulating home environment, and being exposed to a wide range of ideas.... Creative adults, while children, have also been cited as being happier with books than with people..., liking school and doing well..., developing and maintaining excellent work habits..., learning outside of class for a large part of their 'education'..., having many hobbies..., being omnivorous readers..., and forming distinct and closely knit peer groups....<sup>83</sup>

In sum, they describe the creative individual as one in conflict, but recommend further study using controls to confirm this.

Ochse discusses modern conceptions of creativity and classifies people into three major categories. This book is about the creation of things which are of cultural value. Ochse says that "creators appear to be aesthetically sensitive even in childhood." She defines a primary stage not mentioned by Wallas, that of problem finding and cites a number of sources which hold with the idea that finding the problem is the most important aspect of creative problem-solving. In actuality, several authors describe problem solving as a creative process in itself. Ochse has good reason to believe

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<sup>83</sup>Ibid., 435-437.

that creativity is dependent on certain automatically controlled routines, so therefore, there is automaticity. This then engenders 'intuition' and thus fosters creativity.<sup>84</sup>

Continuing with the idea of aesthetics, Laurence Buermeyer states that,

.... aesthetic quality is an aspect of all activity, all perception, all thought, which is intelligent or reasonable.... Take any activity, any impulse however blind, any habit however mechanical, let it become conscious of its meaning or purpose, in the widest sense, and in the process it will become, in one and the same act, a part of the world of beauty....<sup>85</sup>

Yet, as Harold Lee says, "Some persons seem to undergo the aesthetic experience more often than do others, and to a more intense degree....", a major premise of this study.<sup>86</sup> Theodore Roszak agrees with this, his idea being that,

Visionary power, high aesthetic talent may always be the gifts of a few. But the inwardness, the introspective candor on which these gifts draw--this is within the reach of all. In that experience of self-discovery, we find an identity that transcends the ... clash of individual and collective. It is our identity as persons.<sup>87</sup>

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<sup>84</sup>Ochse, 3, 153, 187.

<sup>85</sup>Laurence Ladd Buermeyer, The Aesthetic Experience (Merion, PA: The Barnes Foundation, 1929), 45.

<sup>86</sup>Harold Newton Lee, Perception and Aesthetic Value (New York: Prentice-Hall, Inc., 1938), 5.

<sup>87</sup>Roszak, Person/Planet, 103.

Roszak believes that any "game" which is pursued as an exercise yoga will lost its competitive, public quality and become an inward, or personal, exploration. Examples include "tennis flow," "Zen golf," "the inner game of running," aikido, and other Oriental martial arts--even when the game may not be played exceptionally well. He also concludes that family, education, and work make up the "sustaining web of daily life" and wishes to identify what manner of home life, education, and work can support the "adventure of self discovery" or search for "personal authenticity." At some point, however, this need for self-discovery challenges the technocratic institutions of the society and thus calls into question the collective authority which is zealously guarded by the society.<sup>88</sup>

There is meaning here for the human spirit and quest for freedom. Martin Buber said that "The spirit is truly at home with itself when it can confront the world that is opened up to it...." He continued with "The man to whom freedom is guaranteed does not feel oppressed by causality." He believed that "only as long as he himself enters into the relation is [man] free and thus creative."<sup>89</sup>

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<sup>88</sup>Ibid., 134, xxx, and xxviii.

<sup>89</sup>Martin Buber, I and Thou, (New York: Charles Scribner's Sons, 1970), 100, 101, 103.

## CHAPTER IV

## A VIEW OF THE COMPUTING EXPERIENCE AT UNCG

CONTEXT

This narrative description focused on seven of the interviewees who were selected as a typical group for complete transcription of their interviews. The selection was based upon the amount of experience using personal computers, both in variety of uses and types of PC's. When there were multiple interviewees from the same department, a decision was made to include only one. When there were several interviewees who were equally interesting, then the choice was based on their use of a different personal computer or on the variety of ways in which they used the PC. These participants represent seven different departments at the University and include two females and five males. The researcher would have preferred to include someone from the natural sciences. However, it was either not possible to schedule an interview with those who were recommended in the initial mailings or the individual failed to return the survey.

In general, the selected participants were more emphatic regarding their experiences or feelings in using personal computers than were other interviewees. They have an abundance of outside interests and hobbies and frequently play

with their PC's in many ways. In addition, they have used PC's for at least two years and have used mainframe computers. All are confirmed PC users, although one came into it reluctantly.

The participants use their personal computers daily and lose track of time when involved in a project, especially ones which they initiate. Most can easily work for eight hours at a time and one can do so for fifteen hours. Another tries to limit his time to no more than half a day to avoid a headache from looking at the screen for longer periods of time.

Though it was not apparent during the final selection process, the age range of this group represents a rather tight fit as the youngest was 37 and the oldest was 51 years of age. Another limiting factor was that almost all purchased their own personal computers. Therefore, they represent a socio-economic class which can afford to purchase a relatively expensive item. These individuals represent a group who were not satisfied to wait for the University System to provide PC's for faculty. They were "seekers for solutions"--a professor's terminology--to their needs for materials and productivity.

An interesting aside is that they did not choose to spend money either personalizing or increasing the comfort of their offices. Several offices had pictures on the walls, some had cartoons posted on the door or walls, many had some family pictures. There were none who had plants or any special

furniture in their offices. Essentially, the offices were utilitarian, a basic place to work, with some being relatively neat and others extremely messy.

This narrative inquiry study is focused on the positive feeling phenomena that transpire with the use of personal computers by the participants. These include feelings of enjoyment or excitement while using a personal computer. They are also demonstrated by the participants' lost sense of time when using a personal computer--frequently for many hours. Sometimes positive feelings are actually the result of liberation and creativity issues versus control issues. Computer users have positive feelings when everything on the personal computer system they are using is working properly. When something does not work properly, there is an immediate negative response and the user is likely to feel somewhat less in control of the situation.

Table 2 presents each participant who is described in the study with an unmatched listing of the things which they say manifest positive feelings when they use personal computers in one column and the actual terms they use in talking about their computers in the second column. The feelings and terms were gleaned from the transcripts where they occurred. The concepts represented by them will be discussed in several sections of the narrative.

TABLE 2  
 POSITIVE FEELINGS AND DESCRIPTIVE TERMS

<u>PSEUDONYM</u>	<u>POSITIVE FEELING</u>	<u>DESCRIPTIVE TERMS</u>
Kerrie	Helps do Work Gives Speed Enjoys Paint Program Likes Word Processing Lost Sense of Time Better Job on Projects Confidence Comfortableness	Wonderful! Really Neat! Fast, Easier Amazed Engrossed Fun Play Got a Little Crazy Free Flowing
Paula	Provides Employment Likes Colors Likes Interactive Lost Sense of Time How Many I Use Loves Spreadsheets	Very Interesting Fun Awesome Likes, Loves Challenge Off & Flying Click-on
Frank	Socialization Effect Communication Scheduling Telecommunications Control of Work Dependable Lost Sense of Time	Learning Cranked That Out Really Neat! Talk (network) Awe
Martin	Helps Him Work at Home Speed No Blank Page Enjoys Learning Lost Sense of Time	Works Enjoy Appreciates Sort of What I Do



TABLE 2, CONTINUED  
 POSITIVE FEELINGS AND DESCRIPTIVE TERMS

<u>PSEUDONYM</u>	<u>POSITIVE FEELING</u>	<u>DESCRIPTIVE TERMS</u>
Perry	Work Formatting Capability Always Something on Page Fascinated With Click-on New Way of Writing Can Jump Around Qualitative Difference Lost Sense of Time	Likes Work Look is Exact Likes, easier Fluid Territory Amazed Click-on No Excess Baggage
Bob	Draws Better, Straight No Messy Glue, Tape Can Do Totally on Comp. Greater Artistic Ability Greater Expression Speed Editing Ability Awesome Capabilities Participation Ability Production Tool Expect Quality Interactive Great for Learning Lost Sense of Time	Interesting Subject Cleaner Sharp, Straight, Wonderful Lines New Aesthetic Prouder Carried Away Awesome! Pulling Stuff Off Faster Fun & Play Exciting Maniacs Click-on
Arnold	New Type Learning Proc. Fix Mistakes Provides Income Visible in Community Tax Write Off His Hobby Likes Everything Rational Thinking Stretches Mind Likes Programs Editing and Control Family Community Work Lost Sense of Time	Fun Good Love Enjoy Super Control A Gas! Efficient All-Consuming Nature Better Putting Thoughts Out Hobbyist Omnipotent

There is quite a range of interests and uses of personal computers among the participants. These include the ways in which they use personal computers and the interests they exhibit, the types of new software which they would like to try, and their wishes for the future of the technology. All use their personal computers for productivity of materials which they need, in artistically creative endeavors, and/or for playing games. All have a sense of rising expectations for what they need in the future.

A recurring strain regarding the use and necessity of personal computers revolved around the status of the faculty person in the tenure track. Those who already had tenure used a personal computer for doing the work they needed, or more often wanted, to do. Those who were working on tenure more nearly felt that they had to use the personal computer in order to be able to accomplish all that was needed for this process. Enjoyment was a side issue in this case. One person's perception is that "those who are not tenured learn how to use computers." This actually becomes a part of their perceptions of the external pressures or controls on them. In some cases, this is truly a negative phenomenon.

The participants themselves use personal computers in a variety of ways or with differing intensities. Where one uses statistical programs daily, another rarely does the type of research which requires the use of statistical packages or spreadsheets and would seek assistance should the need ever

arise. The latter even has an antipathy toward trying "LOGO" as it is perceived to involve "logic, and math, and statistics." Where one uses a PC to network with an extended communications family, another purchased a modem and never used it to log onto any system, finally selling it to a department on campus. Table 3 shows a comparison of the types of uses for the participants whose activities are described in the study and the types of new software programs they would like to try.

TABLE 3  
USES AND INTERESTS

INTERV.	USE FREQ	SOFTWARE	USES	THINGS TO TRY
Kerrie	Daily	Leading Edge WP Paint Program	Writing Books Teaching Materials Drawings & Music	Desktop Publishing
Paula	Daily	Word Processing Paint Programs (3) Telecommunications Music Hypertext Data Base Animation Spreadsheets VAX editors SAS SPSS-X TUCK	Writing Play Work from Home Play Play/Work Work/Play Play Work/Play Work/Play Work/Play Work/Play Work/Play	Scheduling Programs Things to Do Programs Rendering Program
Frank	Daily	Word Processing  Scheduling Prog. Statistical Prog. Data base Spreadsheets Games Telecommunications	Class Materials Publications Office Schedule Statistics for Pub. DBase on Students Statistics/Graphics Play E-Mail & Bitnet	Paradox PageMaker Harvard Graphics Clipper (DBase Compiler) PC Tools SPSS-X for PC
Martin	Daily	Statistical Word Perfect Plan Perfect	Analysis of Data Word Processing Spreadsheet Analysis	Desktop Publishing

TABLE 3, CONTINUED

USES AND INTERESTS

INTERV.	USE FREQ	SOFTWARE	USES	THINGS TO TRY
Martin		Data Perfect Utility Programs Games Draw/Graphics Desk Accessories Translation Prog.	Data Base as Cholest. Managing His System Play With Family Play Management/Schedul. Editing Other WP	
Perry	Daily	MacIntosh WP Hypercard Draw Programs  Desktop Publish.	Manuscripts/Lessons Programs for Learning Drawing Figures for His Lessons Creating Materials for His Lessons	Better Scanners
Bob	Daily	Pagemaker PC-VT Draw/Graphics Video Production MacIntosh WP Games	Graphics Designs Translation of WP Create Products Create Videos Word Processing Play	Music Programs Rendering Programs Optical Storage
Arnold	Daily	MIDI Software Telecommunications Games Appleworks Manuscript Prog. Publish It Word Perfect IIGS Beagle Brothers-All Multiple Programs	Create Electr. Music Computer Networking Play w/ Family WP/Data Base/Sp.Sh. Manuscript Production Desktop Publishing Book Manuscripts Utility & Desk Acces. Beta Testing/Play	Everything

In describing this view of their computing experience, it bears noting that there are certainly some negative feelings among participants, as is demonstrated in Table 4.

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TABLE 4

NEGATIVE OCCURRENCES WITH PC'S

System Function Problems	Expectations of Self, Speed
Poor Software/Documentation	Expectations of Others
Unfriendliness of the VAX	Lack of Support for "LOGO"
OCLC & Jaclin	Memory Limitations of PC's
Apple Non-support for System	Blaming Self for Problems
Improper Uses of PC's/Viruses	Problems with DOS
Time Taken Away from Family	PC's Making More Work
System Incompatibilities	Fear of Certain Software
Changes in Thinking/Writing	Lack of Unified Market
Problems with Mail Order	Noise of Dot Matrix Printers
Depersonalization	Fear Materials are Stolen
Isolation	Loss of Data

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The majority involve feelings of frustration and dislike which occur in various aspects of their computing experiences. These feelings, in reality, are a part of the themes which are described in the study and will be discussed within the relevant context, for example, as an issue of control or rising expectations.

All of the participants are self-taught in their use of personal computers. In several instances, participants have had negative experiences when attending computer classes at various institutions. It is also an issue of control, however. The control may be from wanting to learn at their own pace and in the time, place, and way of their choosing.

The control issue may also be one of not exposing their ignorance during the stage of learning.

The primary themes representing the phenomena which occur while using PC's manifest themselves in the collective stories of the participants. These themes are "Learning Style," "Rising Expectations," "Playfulness," "Liberation," and "Creativity." Playfulness has a subtopic which is related to the flow experience. Liberation has a subtopic of control--specifically locus of control. Individuals repeatedly profess that their enjoyment when using the Personal computer is affected by whether they want to do something or whether they have to do it. These themes are:

- Learning Style, or the preferred way in which they acquire new knowledge and experiences in any field or with new technology;
- Rising Expectations, or the increasing demands the participants have placed upon them, either by themselves or others;
- Playfulness, or the sense of gladness or joy which accompanies their activities;
- Liberation, or exerting autonomy over their own lives, essentially operating under an internal locus of control;
- Creativity, or the process of reproducing an image in some medium; also, the ability to solve problems in an ingenious manner.<sup>1</sup>

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<sup>1</sup>More complete definitions of these themes are presented in Chapter I.

LEARNING STYLE

A recurring word used by the participants throughout the interview process was "learning" and its associated theme of their "learning style." They all say that they enjoy learning and frequently refer to it as "play," therefore, this is closely related to the theme of "Playfulness" which is discussed in another section. All are self-taught, most because they prefer learning on their own with the associated control which they have and as that fits into their life style more conveniently than do formal classes. Several have attended classes in the past at various institutions and generally prefer trying new programs on their own. Those who develop software programs or educational programs for their classes approach the process by applying their own particular wishes for interactive user interfaces, friendliness, immediate feedback, and control of the process.

Paula discussed her preferred method of learning new computer programs. A feature that she likes to see on personal computers includes interactive programs as she analyzes that her learning style prefers participatory things. In addition, Paula really likes anything which has an abundance of colors which is why her preferred programs are graphics. She also likes programs to be consistent and logical enough that she can use them after figuring them out herself. She never uses tutorials as they "take too long" and



because she likes to skip around. She does say that "if it were done in Hypertext where you could click and move where you wanted to go ... I would probably be happy with it."

Paula's best feelings, in her view, occur when she succeeds at some task on the computer, when she can figure out why something fails to work and then suddenly have it work. It is a "challenge" to her. She likes software that allows her to glance briefly at the manual and then begin working because she understands its logic and it is consistent. Then, she says, she is "off and flying with only reading for errors and so forth."

All of the participants express their enjoyment of learning new things with their personal computers and, in fact, lose track of time while learning. Frank says that if he is "really in to a project, especially if ... learning something new and it's not quite working, then hours can go by." It appears that those with the most understanding of the computer functions enjoy learning more when there is a greater difficulty. Martin fits this characterization and says that:

Well, I actually enjoy figuring out new things. I guess that's why I appreciate complicated programs. There's always a new feature or other. Like, I subscribe to about four computer manuals, plus I get the "Word Perfect" magazine.... I do grades on my computer.... But the grades are ... computed as numbers. And there is a function ... in "Plan Perfect" ... where it will translate numbers to letters. You set up a comparability column, essentially .... But I enjoy learning those things. I find them enjoyable, fun.

Bob describes the interactive nature of personal computers as being "really good" and "obviously great for learning." He views this as qualitatively different from sitting in front of a television where "you just kind of sit and observe." He says that with the personal computer, "you can sit down and participate in something with the computer." This carries into their own roles as educators. Arnold has a commitment to learning and demonstrating the values of personal computers in student learning. He says that:

.... Back where I started with all this, I kind of backed into working with computers and fell in love all over again with the idea of using it for teaching.... there are lots of things to help people to explore ... in different ways....

Arnold is totally self taught by observing and reading "voraciously." He also learned a great deal about computers when he worked in business with both CP/M and MS-DOS systems. He learned a great many diagnostic skills as he had to make decisions in order to solve problems. In addition to diagnostics, he did a lot of "operant" specification--a form of programming--and documentation of the computer system.

During his doctoral program and these work experiences, he observed both good and bad software programs and learned the types of user interfaces which he wanted to utilize in any he wrote. Arnold is very positive about a lot of the music software which has been written, much of it in game format. There is software which is very interactive and has the

learner press the space bar when they "hear a wrong note." The good software and his desire to write software which was appealing and useful to students inspired him in developing his own. He also wanted to prepare software which was not limited by a student's inability to type well and was therefore effortless enough for the user to concentrate on the learning process.

I was very careful with the user interface for my software and I got it down to the point of holding the operator to the two arrow keys to highlight your answer and the space bar to enter. So you can just leave your hand parked ... and go through 100 programs, all with the same interface....

Both Arnold and Perry like giving their students immediate feedback when working with their programs. Arnold refers to the advantages of this over having to wait for several weeks to discover their mistakes. He describes the old method of doing homework in his field as follows:

.... you were given your assignment, you went home, and built your misconceptions very carefully. You wrote it out, you turned it in, and a week and a half later you got it back and found out what you got wrong. In the meantime, you have cemented those misconceptions with Crazy Glue....

Therefore, he and a colleague developed a computer program that allowed students to work through assignments and obtain immediate feedback and gradual movement toward the correct answer. The students turned in their work after having "fixed their mistakes." The system allowed students to work

independently, without finding an individual to assist them each time they wanted to practice or without using a tape system and workbook which provided unidirectional exercises. Instead, the computer was able to give sounds that allowed them to move from "was the first note higher or lower than the first" to "chord structures" and "textures." It allowed the development of a program which offered learning activities that varied from one practice session to the next. Where the older tape-recorded exercises provided only a fifteen-minute fixed learning sequence, the computer-assisted program converted this into a one-hour variable application.

Arnold has been involved in additional development of software for music education. Exposure to poor quality software influenced his way of designing the user interface and documenting the programs. An early exposure to good software demonstrated how it could be.

Some of the work has been done in game format.... "Sebastian".... will show an example and play it and say 'What is wrong--pitch, rhythm, melody, or nothing.' And it goes all the way up from "Mary Had a Little Lamb" to Stravinsky's melodies in alto cleft with a note out a tenth of a step as the error. I mean there are all levels. And the teacher can put in materials, too. So, it's really very, very flexible and the kids just eat it up. And yet it is sophisticated enough and, then once you can figure out that it is a pitch that is in error, then it will say, 'OK, which note is wrong.' It will start playing and say 'Press the space bar during the wrong note.' So, you actually have to be thinking and interacting during the whole thing.

Another key concept in both Arnold's and Perry's programs for their students is flexibility, as well as immediate feedback. Perry believes that his work is "like a gallery catalogue" combining different disciplines for learning, is a "user friendly book," and is much easier for students because "they decide what they learn." There is no hierarchy, no priority assigned to any one component. Therefore, it pleases him that the students have "no baggage" to carry in their learning process. He likes this for himself, where you select that segment which you wish to learn.

Perry has ideas of what he would like to see in the future for computer technology which are related to his particular interests in developing teaching materials. He would like to see more "interactive applications;" and move "away from the book mode of thinking." He believes that companies make the biggest mistake with computers in trying to imitate books. He says "let books be books!" They are crisp, clean, accessible, and one can return to them time and time again. Instead of imitating this, he wants personal computers to become "truly interactive" and "user friendly" where the user does not become mired in unwanted information. He would like to have a "three-dimensional core...where you can jump from this group to this group without ever changing books."

It seems that all of the participants prefer learning how to use personal computers on their own and with programs which are flexible and allow them to choose the order of learning.

They enjoy learning programs that are challenging as well as beneficial or programs that are simply for fun.

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RISING EXPECTATIONS

All the participants who are described in the study have used personal computers for at least two years and most have used them for at least five years. In all cases, they have moved to a level of computing where they either need or want something more than their existing systems and/or software. In nearly every instance, the overriding and primary rising expectations are that they want faster and more powerful computers. Other expectations include more memory, smaller computers with the same power, and more affordable systems. Paula wants the memory power of a mainframe computer on her desk since she uses both types and is used to having very large files on the VAX. Martin says that the minimum requirement on a PC system is 4 megabytes of memory.

In general, they all expect more out of themselves than they did a few years ago and, in some cases, they are pressingly aware that others expect a lot more. This expectation is sometimes, ironically enough, in the realm of speed. Other people know they work with personal computers and expect them to do the work on shorter notice and more quickly. Most are planning to purchase another PC in the near future. The only participant who did not really emphasize the need for a faster and more powerful PC has a very fast system at home. In the participants' cases, the need for speed is the result of their own changes in perception of time.

The expectations of others become, in some ways, a negative influence in the lives of the participants. Kerrie is generally happy with both her computers, however, she would still "love one of those enhanced" 386 computers. She wants another computer for two reasons. One is that the speed is appealing and she would like to do things faster. The second is her perception of what is expected of her as a professor, as she depicts:

Well, see, up until three or four years ago, I had no use for a computer. Now, I can't imagine doing without it. I would go crazy. With all that I have to do and the short amount of time I have to do it in, I couldn't.... I think that part of the problem is that as more of us have been able to produce more, the expectations of those around us have grown commensurately. I think in the old days--pre-computer--I wouldn't be expected to do quite as much as I am expected to do now for promotion and tenure....

She perceives that members of her department are expected to do more by the nature of the field. She is also aware that there are professors who meet the criteria and never personally use a computer, though she asserts that they invariably have someone else use one. Her impression of whether one personally uses a computer or not is more a function of their age, their adaptability, and their tenure status. She says that "those who are not tenured learn how to use computers." This sentiment was echoed by a number of interviewees, evidently working on tenure papers.



Bob experiences his own sense of rising expectations for the work he does but also that of the faculty and staff at UNCG who want a faster and better product. He ties this directly to the Macintosh personal computer and its capabilities. In one sense, he views the dubious side to the situation:

The bad part, the down side of all this, I think, is that I feel like the computer has helped to create a new sense of speed. You know, that people expect things quicker because you can do them by computer, and in some cases, the things that you do on computer take longer than the way you used to do them.

The sense of speed that everyone has is sometimes false as the graphics programs are much slower than are word processing programs, though he does say that personal computers are really faster or they would not use them so much.

Another rising expectation which has both internal and external locus of control is on quality. Everyone expects a better quality product. Bob believes that "with the quality as good as it is now, you want that quality and people expect that quality and so you end up spending more time on it." He thinks this is an "odd turn of events." Most now demand, and expect to have demanded in return, laser quality printing. Kerrie bears this out and would like to try a desktop publishing program as she would "like to do some slicker stuff than [she] can do right now" with a word processing program. Bob carries this idea further as he contends that there is a

whole new aesthetic which has developed with the advent of the Macintosh computer in design work and which is associated with the desire for a particular level of quality. There are things which can be accomplished with the Macintosh which he feels absolutely cannot be done by the human hand. Since the artist can achieve such levels through using a computer, they and everyone else expect that quality. The result is often more time consuming than with manual techniques, where the artist was less likely to change anything as it frequently meant beginning over again. He also rarely prints with his own dot matrix printer at home as he is so used to the quality of laser printing that he cannot settle for less.

Several participants used a more definitive terminology. They said that the "standard" or the "quality control" has been raised and specifically mentioned that this is true for papers, resumes, or other presentation materials. They view it as no longer acceptable to have typographical errors in most materials of this kind whereas it used to be that as many as three typographical errors were acceptable. Nearly all the interviewees echoed the expectations of the appearance of printed copy. Perry said that the printout from the VAX has "that IBM look--the IBM typewriter look to it." He says that is great, if you like typewriters. However, he adds that "you get used to this typeset-looking business" and that typewriters seem "as if you go back to the Stone Age."

In some cases, these increases in speed, memory, and hard disk capacity are requisite. This is not true in other cases. It is simply a fact that what seemed so fast one year ago now seems interminable in the world of computing--any kind. We are not very forgiving of our computers in these cases. One participant is talking about the difference between waiting twenty seconds for a graphics rendition to redraw itself on the screen after being changed and the present expectation of three seconds in a more powerful system. There might have been a time in the past when we would not even be aware of twenty seconds passing. There seems to be something of real significance to this phenomenon.

Rising expectations has a subtopic which includes negative feelings regarding computers. One such negative feeling for several participants concerns mainframe computers such as the OCLC (Ohio College Library Center) system, the Jackson Library Jaclin system, and the UNCG VAX. The views of the library OCLC and Jaclin are that they are too slow and, in some cases, have too few applications. The Jaclin system does seem ponderous, especially with a slower modem or when there are a lot of users on the system. However, when one considers the infinitely faster searching capabilities of the computer over the former Card Catalog system, there is no comparison. It is just that our sense of time is affected and we have greater expectations of what must be accomplished within that time. At least, Jaclin now provides accurate

information as to the availability of a book. This allows students, faculty, and staff with their own personal computers to do searches of Jaclin from home and reserve their library time for more productive uses. That invaluable capability was involved in preparing this study as library time was then at a premium level.

Another subtopic of rising expectations involves the participants' views of the future, especially personal computer technology. Most of these involve PC power, smaller size, and affordability. Some are quite unusual, e.g., Kerrie's ideas regarding computers and library materials of the future. She says:

I expect that they are going to be very tiny and very powerful and easily portable. I would like to see one in my purse, with the capabilities of these right now. What I would really like to see in terms of my field ..., is the opportunity for people to see an entire book on a credit-sized card on an optical laser strip where they can take it home and put it into a reader that will have color, sound, and motion. And be able to even see acted out any book that they wanted to check out and read. In a portable way so that you can take it out under a tree, like you can a book--everybody complains of that. Ah, and so that we could check out anything, any piece of literature, through an automated teller. Setting for a public library, for example, you put in your library card and tell it what book you want; it spits you out a plastic card that you can take with you and read as many times as you want. We don't have to worry about fines and all this overdue stuff. On demand materials....

Arnold would like to see MIDI equipment which he "could put into his hip pocket." Paula and Martin both want large screens--Paula, so she can see several projects at once, and

Martin so he can edit four or more pages at once. Paula wants these screens to have a really sharp resolution and wonderful colors.

Martin, Frank, and Bob would like better voice recognition systems. Bob wants a faster system for graphics that will make changes in real time and much larger optical storage devices. Frank would like more memory in a smaller system and foresees a merging of the computer, television, and telephone. This is actually already here and is another issue altogether.

Most emphasize the need for computers to be so inexpensive that they become available to everyone. They also want to see PC's and software become more affordable in order to allow them to obtain new materials for themselves.

PLAYFULNESS

Most of the participants present evidence that they are playing with their personal computers, even when they are working. Others openly play with computer games or computer graphics, either alone or with their family. The category of "playfulness" is addressed since related terms were used so frequently and because of the frequency of PC use among interviewees during their leisure time. The creativity literature also recognizes relationships between creativity and playfulness or play.<sup>2</sup>

Two of the participants are at "play" whenever they use personal computers. They are more integrated with personal computers than the others and their "fun" seems to be on a different level than that of the others. One also spends a lot of time on CompuServe and often plays with that mainframe from his home. The other uses the VAX and considers that play, though not as much as she would something like CompuServe. She is "afraid" to join one of the online services, apprehensive that her sense of playfulness with computers would be too costly.

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<sup>2</sup>Ochse discusses Freud's and Maslow's comparison of the similarities of childhood play and creativity and also addresses the idea that play must be directed toward a goal to become creative and ultimately productive; Erikson expresses the idea that a sense of playfulness is necessary to allow for experimentation and change and, subsequently, creativity.

Arnold spends a lot of time networking and has been a forum assistant on CompuServe, running "live chats." He really enjoyed it as is illustrated by his description:

But I like live communication. And I am a good enough typist that I can keep up with that. Running a chat and backup can drive you crazy because you have another person or two talking to you behind the scene. And it is sort of like you can communicate without the audience knowing what you are saying so it's 'come on well we need another question here and let's do this and let's do that' and you have to type those commands with a prefix so that the audience doesn't see them. It can drive you nuts! It's a lot of fun though! I learned a lot about that.

Frank is a member of a PC Users' Group which provides technical advice and shareware programs. He also goes "exploring on the boards, just to see what's out there." He finds that boards have personalities of their own, some are humorous and some are "weird." There are 14 or 15 regional networks in his field where handicapped people can "socialize" or obtain information about a variety of subjects, including camps for those who want to socialize in person. He says that this board is "a place where people just talk to each other."

Only two participants jokingly intimated that the use of personal computers had any somewhat adverse effect on their family life. These are two individuals who spend many hours working and playing with the computer and their families appear to have less interest in personal computers. Frank plays a lot of games on his personal computer and sees a

difference between the ways in which he and his family use the computer. When asked if there were any negative impacts of computers on his life, he responded that there were none, except possibly his wife "yelling at me" and saying "are you still on that thing?" When asked if she used the personal computer, he replies "I don't think she would ever use a computer to just play." He considers it to be play when he is learning a new program and contends that the latter occurs when it is a program that he does not really need or when he is examining a demonstration disk. He does not believe that his wife would do that. Another professor indicated that he felt the same way.

Paula often uses the personal computer at home but is married to someone who also likes to use the computer a great deal. One professor who spends a lot of time with his personal computer plays games with his wife and children, who in turn frequently use the computer on their own. This shared playing seems to have an effect on the perceived acceptance of personal computing by family members.

The participants generally have many hobbies and varied interests. The diverse leisure-time activities which the participants say they enjoy are presented in Table 5.



TABLE 5

## LEISURE-TIME ACTIVITIES

<u>Kerrie</u>	Play Piano Play Guitar Oil Painting Computer Painting Partner Dancing	Cross Stitch Furniture Refinishing Automobile Repair Household Repair Travel
<u>Paula</u>	Visit Art Museums Computer Graphics Musical Programs Reading Cooking Musical Programs Gardening Leag. Wom. Voters	Embroidery Crewel Work Knitting Sewing Computer Barjello Photography Walking Attend Plays
<u>Frank</u>	Computer Games Attend Plays Photography Listen to Music Travel	Play Volleyball Play Guitar Walking Gardening
<u>Martin</u>	Collect Records Computer Games Reading Musical Programs	Collect Wines Wine Tasting Visit Art Galleries Attend Plays
<u>Perry</u>	Photography Canoeing Skiing Walking/Jogging Art Slide Collect.	Visit Art Galleries Musical Programs Gardening Computer Graphics Visit Europ. Archives
<u>Bob</u>	Play Banjo Play Drums Play Hammer Dulcimer Drawing	Photography Computer Graphics Tennis & Exercise Travel Dancing
<u>Arnold</u>	Play Music - Many Instruments Computer Games Telecommunications	Musical Programs Walking Gardening

Every participant does something with their personal computer during their leisure time. Those who use their personal computers the least for leisure time are those who use the computers the most in their work, either at UNCG or at home. Two of these use Macintosh computers for either graphics design or creation of Hypercard materials. Though one says that "it is fun to get a new kind of software or new piece of equipment and play with it and see what they do," he prefers to participate in music during his leisure time. He says it is a "more physical kind of experience" and is "massaging your eardrums with all of these wonderful sounds;" he therefore derives more "physical pleasure out of it." He believes that if he did not work with his Macintosh so much during the day, it would be different. He has friends who really amuse themselves with their PC's all the time and he does not view himself as being the same way.

I know some people--that's all they care about doing--sit and play with computers all day long. I'm not really like that. I treat the thing like it's a, just another tool in a way. I don't spend a lot of time playing computer games or dealing with it as entertainment. I think it's because I spend so much time on it during work, that I don't care, I care to do something else. But, ah, rather than use it for entertainment, but it does have the potential for being a lot of fun. I can imagine if someone had a different job where they didn't do a lot with computers, and then they had a computer at home, that they would spend a lot of time playing with their computer--just for the entertainment value of it.

Another participant chooses to spend her leisure time in pursuit of non-computer hobbies such as cross stitch, furniture refinishing, oil painting, and playing the guitar or piano. Kerrie does not consider the personal computer to be the release that her other hobbies provide, especially since it "beeps" at her when there is an error. She also uses the personal computer so much in her writing, both for publication and for teaching materials, that she does not choose to relax with the computer as often. She does on occasion, however, and really becomes engrossed when she is using either her "Microsoft Paint" or "Paintbrush Plus" programs, usually when there is "nothing on television." She finds herself still there at midnight wondering why her back is hurting and her neck is stiff. She says that,

I'd been having so much fun trying to figure out why it was doing so many strange things that I couldn't find anywhere in the manual. I got it to do all kinds of stuff that I didn't expect and that it didn't say.

The interesting phenomenon here is that she is having as much "fun" learning, testing, and trying the program as it seems she would have actually doing the drawings on the computer. She concedes that there are graphics which are resident on her paint program, some by M. C. Escher, which allow her to "fantasize a little." She even describes her word processing program as one which does "all this kind of really neat stuff!"

Paula has many hobbies, however, when asked what leisure-time activity she likes to do most, she says "probably play with graphics on the computer...." The word "play" appears often during her conversation when she refers to computers. In referring to mainframes and personal computers she says, "I play with them all...." These sentiments are echoed by several others as well.

Martin says that he plays a "lot" of computer games, with both his son and his wife. They frequently go to the personal computer when television is not appealing, and most of the games have "outstanding graphics." Even when he is working on projects, however, he seems to "play" with his computers. In fact, he refers to himself and others not using secretaries as much because there are, as he says, "people like me who are hung up playing with them."

It is interesting that he plays "Scrabble" with his wife and war games with his son. This is relevant to concerns expressed by Paula that boys and girls use and play with personal computers differently. Her perceived difference in gender use is why she is so distressed that "LOGO" is not utilized by teachers and supported by the software companies. She feels that girls like "LOGO", whereas boys are more interested in violent games. Frank presented a related sentiment when discussing the phenomena that causes one to say "WOW, that's really neat"--a phrase which displays playfulness. Frank believes that there are differences in the

people who have this type of reaction to using the computer and said:

... it would be interesting for you to do a study in the future about how you go 'that's really neat,' about the personality variables that lead one person to use it as a tool to get the job done and one person who gets a kick out of going 'Oh, that's really neat.' I bet there are some personality dimensions.

In relating his ideas regarding those who say "WOW, that's really neat," Frank further believes that there is a gender difference. This also correlates with Paula's concerns about the gender differences which she views "LOGO" as helping to overcome. Frank describes his perspective:

I think there are two--this is partly my wife's analysis and partly mine--we've talked about this before. I think there are two kinds of computer users and I think that it's partly a sex difference, but not completely a sex difference. I've seen more men relate to it in this way. I think men get into it in terms of 'WOW! That's neat!' and they play with it in terms of ... what it will do. Women, more often, I think, see it as a useful machine to get the job done and they are not interested in playing. 'Let me show you this neat new feature. I don't want to see that beep, beep, beep; don't bother me, I'm busy.' So I think that men are partly into the power of the machine; for the same reason that men drive fast sports cars more often than women. I think they are into it for that kind of power and what it can do. So the answer is that, most of the time when I use a computer, I don't feel much of anything. I am getting a job done. Occasionally, I will see a new program or find a new feature and I will go 'WOW, that's really neat!' and get off on it.... Most of the time, I certainly enjoy it.

It is worth noting that both the women participants, other interviewees, and the writer experience this phenomenon of playfulness with the capabilities exhibited through the personal computer. We say "WOW, that's really neat!" and we say it about utility programs as well as graphics programs. It does appear that the female participants do not play the same types of games or spend their leisure time with the PC in the same way as do the males. However, the male participants who discussed playing games were primarily spending time with their sons while playing such things as "Zaxion" or some war game program.

The ultimate personal computer hobbyist is Arnold, who considers his entire computing experience leisure time--whether writing and sequencing music, writing articles, playing games, trying new software, or "chatting" on the bulletin boards. He apparently has more fun with personal computers than any of the other participants; even more than Paula. He said that to him, "the ultimate computer game is debugging software--computer code." He asks "why waste my time playing 'Zaxion' when I can spend my time figuring out why the heck this program has crashed?" When he was asked what new types of software he would like to try, his answer was simply "everything." In his words:

For me, this is the hobby! I do my music and then when I am tired of doing music, I want something to stretch my mind--and the computer really does it.

And so, in a way, I am sort of the ultimate hacker hobbyist. Or something like that.... I enjoy it.

Arnold is also involved in telecommunications for play more than any of the other participants. He has had a "lot of fun" running chats on the music forum and feels that he has a "home, ... a family community" on CompuServe. According to him, one of his most exciting experiences has been attending a meeting on CompuServe.

One of the highs of my life was attending a meeting on CompuServe several weeks ago where Steve Wosniak was the guest and they had 200 people there--everybody trying to type questions. It was overloading and we were getting dumped off and we had to sign back on. Ohhhhh! It was a gas!.... It is as good on a good bulletin board to leave messages and handle their replies that way.... But I like live communication.... I finally got to AppleFest in Boston a year or two ago and there were all kinds of people there who I've talked with for years and I finally got to meet them face to face.... I like the CompuServe; it's a nice place.

When he was able to attend the conference, he met people with whom he had "conversed" for years. He obviously had to attend this conference at his own expense, a measure of the value he places upon his "larger community" and the rewards it offers him.

The relationship between playfulness in the participants and the flow experience is a subtopic of this theme as there are additional elements of playfulness which have meaning for the participants. Several people in this study mentioned "flow" in one context or another. Most become engrossed when

using their personal computers; one so that it is the ultimate "hobby" and he says "why should I be playing 'Zaxion' when I could be debugging software?"

Progen discussed the importance of flow theory in looking at the intrinsically rewarding experiences in sport in light of Csikszentmihalyi's suggestion that enjoyment and personal satisfaction are available to every athlete, regardless of skill level. She developed and tested a Q Sort Instrument in 1978 and followed with a substantial study of the flow experience among collegiate athletes in 1981. She says that "flow theory provides a conceptual framework for studying intrinsically rewarding experiences." The expressions of the interviewees indicate that their use of personal computers is frequently intrinsically rewarding--sometimes in playing games, when using graphics or desktop publishing, and sometimes in their work. Even though Csikszentmihalyi did associate flow experiences with athletes in high risk sports most frequently, he also stated that these intrinsic rewards were available from countless sources.<sup>3</sup>

The participants refer to "play" or "playing" with their personal computers, both in the context of games and work. Csikszentmihalyi argues that "play is the flow experience par

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<sup>3</sup>Janice Progen, "A Description of Stimulus Seeking in Sport According to Flow Theory," (Masters Thesis, University of North Carolina at Greensboro, 1978); and Janice Progen, "An Exploration of the Flow Experience Among Selected Collegiate Athletes," (Ph. D. diss., University of North Carolina at Greensboro, 1981), 5, 11-12, 39.



excellence," that "flow is potentially available in both work and play," and that "the experiential criterion of enjoyment is a critical differentiating standard."<sup>4</sup> An additional criteria is that of challenge to the individual's skill level during the activity itself. This may relate to the differing perspectives of the interviewees. Those who are highly skilled either look for complex programs or are involved in more sophisticated levels of personal computing--thus is matching challenges with individual capabilities and providing opportunities for flow.

Arnold discusses his "perfect moment" in preparing materials for his students which he experiences two weeks prior to theirs when he develops his materials. Creativity provides its own intrinsic satisfaction. Another indication of the experience of flow is the "merging of action and awareness."<sup>5</sup> The interviewees consistently become submerged and lose track of time when they use their personal computes, e.g., in game playing, graphics, and writing. The primary considerations for this to occur seem to be whether they are interested in what they are doing, enjoying the activity, and intrinsically motivated.

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<sup>4</sup>Csikszentmihalyi, 37.

<sup>5</sup>Progen, 1981, 37-80.

LIBERATION

Liberation has been defined for the purpose of this study as recognizing that one has the freedom to exert autonomy over one's own life rather than being controlled by events, accidents, history, machines, or other persons. The locus of control in the individual is the critical point. This liberation may take various forms, depending on the circumstances of the individual. While liberation for one person may entail obtaining a job and therefore necessities of life, for another it may be freedom from drudgery, routine, stupidity, self, or whatever is limiting their internal locus of control. In the case of PC's, this applies to lack of availability or access as well.

There is an aspect of liberation which pertains to control. Control may include: 1) having control over situations, 2) having control over others; and 3) having a sense of control or mastery over your own activities. It is not liberation when one simply loses control of a situation. Nor is it liberation when one attempts to control others, an issue Freire discussed. He said that in the initial stages of liberation, the "oppressed" tend to become either "oppressors" or "sub-oppressors" as their consciousness has been shaped by their situations. He described liberation as a "childbirth, and a painful one" and refers to both education and work.<sup>6</sup>

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<sup>6</sup>Freire, 29 & 33.

Freire recommends "co-intentional," "problem-posing," or "liberating education" where the teacher and student are both subjects who re-create knowledge. In addition, he said that "men are fulfilled only to the extent that they create their world" and that work must therefore be both a fulfilling pursuit and free.<sup>7</sup>

Another issue of control is that of the rising expectations of others, a perception which may be exaggerated by the participants. It can in fact become a matter of negative influence in that the individual responds adversely to an external locus of control.

There is also a characteristic of individuals in the flow state which warrants comparison with the use of personal computers in that there is a sense of control over their actions and the environment. The participants in this study are adamant, in most cases, that they always feel in control--regardless of whether they are frustrated by some "bug" in the system or other problem. One does say that she feels in control, but that ultimately the user is under the control of the software, hence the programmer.

The participants in this study act on the conviction that they have freedom of choice and do something which is outside of the expected norm. Table 6 lists the liberatory phenomena which they embody.

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<sup>7</sup>Freire, 56, 67, & 141.

TABLE 6

## LIBERATORY PHENOMENA

<u>PSEUDONYM</u>	<u>LIBERATING PHENOMENA</u>
Kerrie	Allowed her to do more than thought possible Wrote two books in one year "Different than girl things"
Paula	Employment in enjoyable field "Different than girl things" Programming and control of computers Frees from writing by hand--illegible and painful Communications via personal computer
Frank	Telecommunications for research & communications
Martin	Autonomous work Varied projects Doing what he likes
Perry	Frees him from writer's block Freedom in instruction & learning Produces a program that is liberating, highly conceptual Better writing More democratic books Interdisciplinary way of connecting divergent fields
Bob	Autonomy in graphics Capabilities that can not do manually Freedom of design Indirectly - allows to act as designer
Arnold	Freedom to perform "with" other instruments, whether work or play Better quality interactive software for students, more varied learning Community on CompuServe Able to earn additional income

There are control issues which become a subtopic of liberation as they are negative concerns which affect the participants. Though these are temporary situations in which the participants feel out of control, they are not helpless and eventually resolve the problem themselves or seek help.

The primary frustrations among this group occur when there are problems with their computing system. This includes problems with their hardware, especially printers, and locking systems. Everyone reported this as a frustration in one form or another and, essentially, it is an issue of control. They feel out of control when there are problems and they are either uncertain of how to solve it or cannot easily do so. An aside to this frustration is that they often do not understand what they do to solve any problem--if it is solvable without returning to the computer dealer. One interviewee, a student says:

Most of the time when I solve a problem, I don't know how it got solved. Like a couple of times ... the keyboard will just jam and you can't do anything ... but ... press reset ... lose what I'm working on. And sometimes I'll just hit SCROLL-LOCK and that will undo it.... and sometimes I'll just get so frustrated I'll start hitting every ... button and I won't know how I got it to get out of it.

The next most frequent frustration involves software, either software that is of poor design or has "bugs," or software with poor or inaccurate documentation. While one person says that most of the documentation she has seen is

"garbage!," an interviewee who has used computers for years becomes particularly frustrated at this situation.

I would be so frustrated because I would be trying to do this and it wasn't working. And then I would blame myself. I think that is one of the negative feelings that people get about computing in that they think it is them when something bad happens and it is not the user. And people ..., that's a hard thing to get over that you did something wrong and you're breaking it. And you're not!

The connotation that they are at fault is an issue of control, as they feel a sense of responsibility when something goes wrong. As this individual says, one often wonders what could have been done differently and how one could have avoided the situation.

The very lack of compatibility among personal computer systems was a concern for a number of the interviewees--either those who had Apple Corporation computers or those who wished to produce programming or educational materials for the marketplace. Arnold is planning to purchase an IBM clone as he is unable to bring himself to program for the Apple IIGS computer. He believes that "Apple is going to shoot it in the foot anyway!" Therefore, he views that he is unable to control the market for his system and will exhibit an internal locus of control by changing to another type of computer.

The somewhat negative feelings about the UNCG VAX which surfaced are related to control as they are not the ones who decide what will be available on the system. The primary

complaint about the VAX is that it is not user friendly (a frequent complaint of any mainframe), the editors are difficult to use, and the editors change (at least are perceived to change) frequently enough so as to cause users to have some problems. In actuality, the comments which participants made seemed to indicate that their problems stemmed from feelings of uncertainty when they used the system. One says that he has to write out all the commands, even for E-Mail, prior to logging onto the system as he cannot remember the commands from one time to the next. In fact, his situation seems to suggest that he uses it infrequently enough to therefore not remember how to perform tasks whereas he utilizes CompuServe much more habitually. It is also doubtful the editors on the VAX have much effect on any of these participants as they all use word processing programs on their PC's. Their use of the VAX editors is relatively rare.

On the other hand, several professors and students enjoy the capability of having extremely large intact files on the VAX, appreciate the support staff available in the Academic Computing Center, like the number crunching abilities, and appreciate the Electronic Mail (E-Mail) which is available. Though there is some negative feeling toward the way E-Mail functions in comparison to services such as CompuServe, the majority of interviewees who use it are quite satisfied. E-Mail capability in itself offers a great deal more individual control over correspondence as the participants can

send and receive messages without having to physically prepare for mailing, to depend on the postal service for delivery, or then wait for a response. The easier one can make a response, the more likely it is that the initiator will receive a rejoinder.

One secretary was interviewed for this study and an interesting phenomenon emerged which is worthy of further attention in locus of control and personal computer use, especially as regards faculty and staff when compared to secretaries. She had very little to say about what she liked to do with computers because she primarily uses word processing or data bases that someone else has created and given to her. In addition, she corrects, formats, and prints material which is already on a disk. She is even hesitant to learn new programs because she says that when she learns something new, it means more work. However, she would refuse to let anyone take her personal computer away as she does not believe that she could do the amount of work which is required without the computer. She does not have one at home but thinks she and her husband will probably get one, in "five or ten years."

Though there are negative issues of control, there are also many positive issues to be addressed--issues where the participants have autonomy or their personal computers have freed them to do things they never thought possible.



Frank really likes the increased control he has over his own work since learning to use a personal computer, in fact, considers that a most positive impact on his life. He feels that it is much easier for him to produce journal articles, though he is somewhat concerned that it is also easier to do "piecemeal publications." In addition, it concerns him that he no longer uses the departmental secretary. Yet, in the end, he views this as a positive impact for himself personally. He feels totally in control when he uses a computer.

And I think that is one of the positive things about it. You know, in some ways the world is relatively chaotic and I think that, when you're on a computer, you have at least a good probability that if you tell it to do something, it will do it. And that is very reinforcing that it will do it fast.

Kerrie has been very involved in producing two books in the past year. Her personal computers were the catalysts which allowed her to complete these manuscripts. She says that "gathering data, taking notes on the computer, and writing articles is so much easier" with the PC than is trying to type, then cut and paste. With the personal computer, she can revise items so they say exactly what she wishes. Kerrie particularly feels confident that she can "get the job done as well as it can be done, in the shortest amount of time." She is amazed at herself and says that:

Oh, it has enabled me to do things I never even dreamed I would be able to do before. I am astounded at what I can do. What it has allowed me to do and given me the opportunity to do. Who would have thought I could get two books written in a year?

This is a phenomenal accomplishment for someone who is preparing materials and teaching as well as writing tenure papers.

There are others who can do things which they view as impossible without PC's. Bob can create graphics which have "absolutely sharp, straight, and wonderful lines" or gradations of light to dark which he simply cannot do by hand. The personal computer also frees him from having to paste or glue items together, therefore, he has a clean surface with which to work. He is prouder of what he can do with the Macintosh than he is of projects completed mechanically.

Paula uses her personal computers for all writing, even letters and notes. The computer frees her to do these to her standard of quality which her handwriting does not allow, both by the illegibility and pain involved. It affords her the opportunity to correspond, something she probably would do without. In her own words, "that would be too bad." Therefore, she uses the computer for almost everything and only writes down an occasional idea or "doodles" while she is in a meeting. She writes letters only with her computer. In fact, her handwritten notes are limited to sympathy cards and thank-you cards. This brings to mind one of Sherry Turkle's

subjects in The Second Self. In that case, use of the microcomputer changed a girl's life by allowing her to enjoy writing for the first time--a process that continued even after she moved into a class with less access to the microcomputers.<sup>8</sup>

Paula uses her personal computer and a network to correspond with a daughter in another state. Her voice was very excited and mischievous as she discusses this. For her, this is the next best thing to having her daughter in the same room with her. She gets to play and talk to her daughter at the same time.

An additional feature of bulletin boards in some fields is that they provide human service information to individuals who might otherwise have a much more difficult time locating these facts. An example is one regional board known as "Equal" which provides information and services geared to the disabled. Frank describes some of the facilities of this system:

.... And you might find files of summer camps for handicapped children on the board. It's also a place where people just talk to each other. And I think a lot of handicapped people who have trouble socializing, getting out, are on the boards and meeting a lot of their social needs that way. Well, from that as a start, there are also self-help bulletin boards around the country. There is a large recovery AA twelve-step program kind of thing. And it is kind of like a ... nationwide Alcoholics Anonymous meeting.

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<sup>8</sup>Turkle, 122-126.

Frank also uses Bitnet to carry on a nationwide correspondence with others in his field. He says that "It's a great system!" One receives the distinct impression that he would not correspond as well without the capabilities offered by the networking system. A number of these boards carry echoes facilities which means that one systems operator (sysop) picks up messages or information and sends it to another and so on. The outcome is a nationwide network. Frank says that he can "put my message here in North Carolina and it can wind up all over the country and I can get responses from people all over the country." He is also planning to do research in his field via this networking system, a staggering possibility for which he recognizes several potential problems.

Regardless of how it is described, Martin is the epitome of an individual leading a relatively autonomous life. He teaches one day per week at UNCG and is able to work from home the rest of the time on projects which require his personal computer. He is involved in a number of quite large and intensive research projects. When asked what he perceives to be the difference between using a mainframe computer and using a personal computer, his answer is simply "control." He elaborated by saying that he has more control with a "micro":

I am not waiting--if I am doing batch processing--for somebody to mount my disks or to access my disk or going into a queue someplace. In that sense, I think that control is just part of it. I think the micro--assuming that what you are doing on the micro is appropriate, is not a

mainframe task--is actually much quicker, if you know how to use the micro well. So control, in the sense that I am not waiting for somebody else to process my job. And, even interactively, if you have a lot of people logging on, I can still turn around and handle things much faster with a micro than I can with a mainframe. And I know exactly what is happening with my data because I can go in and look at it.

The software and hardware capabilities have been truly liberating for his ability to work at home and perform sophisticated operations. Yet he is not "burned out" in using his PC as he often spends time playing games.

Having PC's at home and work allow him the freedom to complete things when he wants, in the format that he wants, and as quickly as he wants. He has sophisticated macros created to perform frequent functions, thus freeing him from having to remember them. Using personal computers to word process particularly makes his job much easier, has in reality changed his way of writing. He explains:

I think that computers change the way you think about doing writing. I don't see things as cast in concrete the way I used to when I worked at a typewriter. It is just so easy to move things around and to rearrange things and to edit that there is a difference between facing a blank screen and facing a blank sheet of paper and in getting started. And in feeling free to make changes. It's just so easy!

Martin's final comment, at the conclusion of the interview, was that he enjoys using personal computers and that they "are liberating."

The sentiments regarding the differences in feelings between an empty page and a PC screen and the according liberation for writing were echoed by Perry. Perry says that he is "never sitting in front of an empty page." His ability to "load a lot [of] stuff on to that page and then fix it up" prevents his ever suffering from writers' block as he never feels that he is "starting from scratch."

Perry also feels that he has a great deal more freedom in programs for his students with the capabilities of the Macintosh and Hypercard. He feels that it also provides a great deal more freedom and control for the students who are taking the class. He believes that "computers provide more democratic books!"--at least the Hypercard capability does since it allows "more freedom" in building activities. In the sense of student learning, this allows students to decide what they learn, within certain realms of control, and does not require that they carry any extra "baggage." He expects them to learn certain materials, but they have some choice as to how to go about attaining the material and without repeating something where they feel knowledgeable.

Perry has created programs for his classes that have found an "interdisciplinary way of connecting ... divergent fields." He uses images, history, dates, vocabulary, facts, and text literature. He compares his program to a museum.

... when I click it on and I open a document, it really is like entering a museum room. Where here

on the wall there are a few chapters with tags and a few pictures hanging here and if you capture it here and right away there is a way of walking the readers through that program. And, since I like to imaging my creation on a three-dimensional level--really, like a museum--where I can see a picture from far away and know there are two or three between there--that's my notion of working on the computer. So, I feel very, uh, it liberates, of sorts. It is a liberating experience because I have a lot of information out there and the screen is just the one that is closest to me, but I know that there is a lot behind or next to it. It is highly conceptual.... I feel that I can do things on a computer that I can never do in any other format. Working on information in a very new way; and link it in a very new way.... it is organized, it is accessible, it is quick.... I have never had any negative feedback. And so, it does exactly what I want it to do and so I am very happy.

Perry surmises that there are definitive differences between what is possible with a Macintosh and Hypercard over what can be done mechanically. These differences are more than just the better appearance which is possible. He describes his feelings:

.... But qualitatively different from word processing and things that can only be done on a computer is Hypercard or Hypertext applications. I consider them as [...] where you can jump from one page to the next without going through the other pages in between. I like that fluid territory and I am working on the lab program for ... cultural history that incorporates images and historical information, a dictionary, and a 'click-on' vocabulary. So, ... I could compare it to a gallery catalog where you can click-on a particular image or a particular name and it will tell you something about the author on a different card behind the first card. If there is interest to access that card on a computer, with a click [sic.]. That a book can't do. A book, you've got to read from A to Z--first page to last page. And if you don't like a page, you can skip it, but you

still have to look at it. You still know it's there, you don't read it. With Hypercard or Hypertext applications, it is totally user oriented. You can go from page 5 to page 18, which is where your interest lies. And you wouldn't know, there is no priority, there is no hierarchy assigned to the pages. Every page is as good as any other page--depending on your interest. I like, that is a new way of doing books, a new way of writing--where you can jump!

Perry also believes that his own manuscripts have improved tremendously as a result of using his Macintosh computer. He considers his work to be "more interdisciplinary, more unusual, and more surprising in a sense." He means surprising as there are more types of items on a page, especially more pictures, and that makes a much better book in his mind.

Bob uses Macintosh computers to develop a level of autonomy in producing graphics that he never really expected when he first got interested in having a computer. Along the way he has developed a "whole different sense" of aesthetics with the graphics that computers can help him produce. He can create some effects with the computer that he "just could not do mechanically. Many of these effects are created with the tremendous editing capability of the Macintosh, in addition to the many varied kinds of outcomes which can be achieved, but primarily because of Hypercard. He has rejuvenating experiences when working with the Macintosh. In his words,

Well, a lot of times, you get this feeling of 'WOW!!!' I mean it's just, there is a sense of



exhilaration you get when you are able to use some feature of the program that does something sort of miraculously. The first time--I can remember the first time--that I started up this ... program and I was able to just draw this circle on the screen and then I could grab that and move it anywhere I wanted to on the page. And there was this sort of awesome feeling of power that you had ... I remember that I typed the word 'ART'--as one of the first things that I did. And I just kind of moved those big letters around anywhere that I wanted to. All of a sudden it dawned on me, well gee, this thing has all sorts of possibilities because you can do this thing a million different ways and keep putting them out and find exactly the right design, whereas in the past, in order to do those things, with mechanical, you made a decision, you put it down, and that was going to be it! If it required actual art work with pen and ink because you drew it on the page and if you didn't like that, you threw it away and you did the whole thing again. So, I think there's a lot of feeling of exhilaration and some feeling of power that you have at your disposal to make changes. I still get that feeling.

This offers one a great deal of freedom to try new ideas--whether with graphics programs, desktop publishing, spreadsheets, or simple word processing.

In the past few years, Arnold has begun developing his abilities with electronic instruments which have computer capabilities. He can become a bass player or a piano player with the aid of this equipment. Though piano is not a good instrument for him, he can play the melody well enough and turn on the accompaniment for the appropriate style. He has actually caused some frustration among other musicians in town because they view him as taking away some of their work. His opinion is that the electronic instruments allow him to get

work that he has "been shut out of for years." In the process, he has fun playing for dances and supper clubs.

The Apple IIGS and MIDI equipment provide him with a lot of autonomy. He can write music, record it with his equipment, play it back, and add any combination of sounds he wishes. His ability to provide accompaniments for music practice sessions is something that is emancipating for other musicians since good accompanists are in short supply everywhere. It also frees the musician from being dependent on someone else's schedule. He is able to do this though he has "zero, zilch keyboard technique." Arnold is proud of the things he is able to do and that he is "totally self taught." His PC holds a lot of meaning for him, more than just a tool. He says that the computer stretches his mind and views himself as the "ultimate hacker hobbyist."

Paula mentioned a book that is one of her favorites, Zen and the Art of Motorcycle Maintenance, within the context of people who do or do not adapt well to technology and the idea of one's relationship to technology. She discussed Pirsig's relationship with his motorcycle and says:

There is a long trip he is taking.... I think he probably feels very positively. That he understands his machine and he is really the controller of it.... they are really related to each other and that they have a good relationship-- not man versus machine, but man with machine....

CREATIVITY

Creativity is defined as the process that occurs when the imagination produces an idea that is conceived and the individual attempts to transfer it into some medium, as perfectly as possible. Creative people have imagination, autonomy, flexibility, playfulness, motivation, and tension. There are many facets to creativity and a variety are represented by the individuals in this study. The participants were asked what they considered to be the most creative thing they do. Then they were later asked about the most creative thing they could do with the personal computer.

Creative uses of computers by the participants in this study revolve primarily around their work, graphics and drawing programs, and writing for publication. All participants use either a graphics program, desktop publishing, and/or games on their personal computers. Three affirm that the most creative thing they do involves use of a personal computer.

Table 7 lists what the participants say is the most creative thing they do or the choices they gave when they could not decide. It also bears noting that all want to try desktop publishing, graphics, or rendering programs in the future--all programs which invite creative activities.

TABLE 7  
 MOST CREATIVE THING I DO

<u>PSEUDONYM</u>	<u>CREATIVE ACT</u>
Kerrie	Teach
Paula	Cooking; Maybe computer graphics; Maybe sewing Graphics with her granddaughter
Frank	Doesn't feel creative lately, but Black & White Photography
Martin	Cultivating ideas; bringing themes in from different places and applying them to a new setting Good critic, editor, reviewer Putting wine and food together (Aesthetic)
Perry	Write books. Used to write with more flow. Now flow of images. More creative books, less traditional Then develop his program.
Bob	Design work; has greater flexibility, rendering; different aesthetics
Arnold	Perform--with instruments, key- board, or computer Debug software

Paula stated that the most creative activity for her was "probably graphics on the computer," but her first response was "probably cook." She ultimately could not decide among three. Bob says that his design work is the most creative, and that he absolutely would not be a designer if he did not have the Macintosh computer as he simply could not go back to doing everything by mechanical means.

The rest selected some aspect of their work or an artistic endeavor although several hesitate to assign creativity to their use of PC's. Frank said that he does not believe his writing is creative, or at most 10% creative, and the rest is 90% drudgery. Kerrie refers to "when the creative flow is pumping" in her writing but says that she does not view what she does on the computer as creative. In addition, Kerrie does many creative projects around her home, for example, furniture refinishing and cross stitch. She was extremely creative in a refinishing project where she developed a special method for the desired effect--though she might consider it creative problem solving at best. She does not feel that there is any comparison with what she does on a personal computer and what she does in playing the piano or guitar. Her description of her relationship is that of a different type of phenomenon, one in which she "plays with the computer ... [but] play[s] the piano." It appears that Kerrie is withholding judgement in part, waiting for affordable Hypertext and Hypermedia programs that work well with her

systems. She says that she has "seen some Hypertext, Hypercard, Hypermedia programs that just knock [her] socks off!"

Martin had trouble making a decision on this question and could not pick just one, as he does not believe that he has any artistic creativity. He finally said that cultivating ideas and bringing themes in from different places and applying them to a new setting was the most creative thing he does. Another part of creativity in his view, scientific creativity, is that he has "good insights into processes." He approaches his roles as a critic, editor, and reviewer as well as his hobby of melding good wine and food as the same thing and says "that's part of creativity ... new applications of old ideas."

Arnold states emphatically that the most creative thing he does is perform, either as a professional musician or with a computer. He has been giving solo performances for years and also plays with several groups in this area. His description regarding the "performance" is:

Perform. That's whether I'm doing it with a bassoon in my hands or with a computer in my hands. It's really getting my ideas out to other people. Whether those are sounds, or printed words, or being able to organize and share the thoughts and get them outward. That's the same thing writing for magazines....  
... the writing, the composing, if you want to think of it that way, whether it is words or notes makes no difference. But it is a performance vehicle for me.

Perry creates a lot of things with his Macintosh computer, combining word processing, graphics, scanned images of art work, and a branching type of learning program. He combines language study and cultural history through this medium. He writes a lot and we discussed how his writing had changed over the more than five years during which he has been using a personal computer.

Actually it is problematic in a way. Uh, the machine does change the way you think--it really does. You know, I don't use a pen anymore, or a pencil. And ... writing with a pencil creates a different sentence than writing on the screen instantly changing the word that you don't like. So, the flow is gone--in a way.

This was a disturbing statement and it was indicated that a further explanation was desired.

Yes, I could sit down five or ten years ago before I began with this and write a ten-page paper in an afternoon. You know, just sit down with a piece of paper and pen and just write it out. It would be a continuous flow; I would be fairly happy with my effort, then I would cut it up and lay it out on the floor. And I would say 'maybe I should lay that paragraph over here' and then after maybe a certain number of hours working like this, I would have the article. Now! With the computer, it is a totally different process of creation. I sit down and write the same way that I would do with a pen. But, ..., I get very critical right away. I say 'I don't like that verb' so before I start the very next sentence, I fix up the original sentence. Which slows me down a bit. But, if I do get to the last sentence of the article, I have the finished product. I don't have to lay it out any more and cut it and paste it because when I have the last sentence, then I am done. So, the process is different. And I sometimes worry about whether it

is better. Did I get dependent on that instant fix that the computer has?

Upon further discussion, Perry does believe that his finished product is better now that it was then. He also writes more. The telling statement he made was that he also "never [sits] in front of any empty page." To his way of working and in his way of thinking, this is a key point. He says that he can "load a lot of stuff on to that page and then fix it up." In essence, the personal computer prevents writers' block. He also sees the drawback in that he is "never really forced to start from scratch."

Students in his classes also create more using the Macintosh computers which are available. Where they used to laboriously write two or three page autobiographies, they now turn in eighteen page tomes. In addition, they are more interested in the process. He relates that their work "grows organically" with their memory as they realize that they can insert memories whenever they occur.

Both Perry and Bob see qualitative differences in what is possible with their Macintosh computers. Perry feels that writing books is the most creative thing he does. The personal computer is his "tool to get it out."

... The computer is my medium in which to organize the information in such a way that the publisher can publish it. And so I basically cook it up. That's my creative part; and then I put it on paper, and they print it, and caption it and lay it out and send it back to me and ask me if that is



OK. That's probably the product when someone looks at it.... I couldn't imagine doing it without the computer. I've done one without the computer and it was a learning experience. It was important. I think I typed it four times--and I got to know the book very well. And, I think it is my most traditional book because of that. It drives off the idea that the sentence reigns supreme that everything is geared toward the sentence. And there is a flow of images, footnotes or explanations, or links of information--the most straightforward, monolithic presentation--just like a typewriter. That's that. And, ever since I switched over from the typewriter to the computer, my books have become--to me at least--more interdisciplinary, more unusual, and more surprising in a sense. You find more surprising items on a page, including pictures. And for me, that is a better book....

There are a number of processes which Bob can achieve with the Macintosh that are so much better than with mechanical methods. For example, the computer can draw absolutely straight, sharp lines. He can plan a project and can arrange the graphics in any way he wishes, providing him with greater flexibility. In the past, a decision had to be made immediately about the layout and then it was very difficult to change. The Macintosh allows infinite changes. He demonstrated another feature which the Macintosh can do much better than the human artist.

Speaking of things that are better done on computer than by hand--here's a case, this gradation where around the inside of this magnifying glass, it goes from very dark to very light around these edges. So you get the feeling of some light and shadow coming in this way. There's no way--you know, and I feel like I am a fairly good artist--there's no way I can sit down and draw that kind of gradation with a pencil. I mean the computer does it absolutely perfectly. And you get this real smooth

thing. And when you look at that, you know that it was not rendered by hand, that it had to be done by some computer. So there is a whole different kind of aesthetic that is starting to develop, to develop around the fact that you can do things by computer. When you see that, you know that it is computer done, that it is not hand done. And I think that people in graphic arts and the design field have had to change their whole sense of--I don't know if they have done it consciously--but they are in the process of having their whole sense of aesthetics changed.

Bob is not denigrating this change by any means. He is just aware that this "art" did not come into play fifteen or twenty years ago. He finds this development of a whole different sense very interesting. He continually referred to the new aesthetic which has developed from the use of "good" computer-assisted design. He is especially intrigued by the ability to find "exactly the right design."

A program which a number of participants mentioned they had seen and/or would like to try is PixArt's "Render Man," a program which allows the depiction of nearly any object with differing exterior colors and textures. For example, a teapot can be depicted in either a metallic or wooden finish. Therefore, designers can determine just what an object will look like prior to production. Bob saw a demonstration where the teapot looked "like somebody had just carved [it] out of a solid block of wood." The program took approximately five minutes to do the rendering. He says that "it is incredible what kind of tricks you can pull off!" and that "it is true magic."

Creativity is exhibited by the participants when they use personal computers either in preparing products for work and play or in problem solving. Martin is able to utilize the PC to creatively apply ideas in new ways and to function as an editor and reviewer. Paula is able to produce Christmas cards, construct Barjello cross stitch patterns, and do colored graphics presentations with her grandson. Arnold is able to produce, replay, and print music as well as become almost any instrument he wishes. Kerrie creates books and class materials in a much easier and faster way and plays with paint programs. Bob is able to produce designs that are exactly right with varieties of expressions that he could not do any other way. And last, but not least, Perry is able to prepare his own manuscripts for publication and programs for his students which have many varieties of experiences and aesthetic values. Perry and Bob particularly view the possibilities offered by their Macintosh personal computers as qualitatively different from anything else which they can do.

SUMMARY

The participants in this narrative inquiry study have many positive feelings about the use of personal computers. They have few negative feelings at all and these are related to problems with their systems, some perceived lack of support, or external controls placed upon them. Most have purchased all of their hardware and software and have learned to use personal computers on their own. They are continually interested in trying new software and prefer interactive, logical, challenging, and consistent software. Those participants who produce programs or musical software want a cohesive marketplace where materials are available to PC users, regardless of their brand of computer. They also have certain criteria in mind for their products, e.g., interactive and "fluid" programs, which allow the learner many choices in the process.

In some cases, they allude to the fact that personal computers take more time than older methods. They say that this is either due to attempting to find "the absolutely best design" or because they become "instantly critical" of every word and may change a sentence immediately. On the whole, they agree that the personal computer saves them a great deal of time in various activities and that they could not accomplish everything otherwise.

The participants have some very real concerns about computers such as their realization of gender differences in the use of computers and the computer's capacity for providing a another means for sorting of society. Arnold, Frank, and Martin especially expressed their distress that they can be another way of sorting our society into the "haves and have nots"--either by way of people who do not want to deal with computers or who lack the facility to use them. For those with the facility to use PC's, they provide the opportunity to do "things of better quality and more efficiently."

Other concerns include perceptions of external controls, e.g., tenure requirements and rising expectations of others for speed and quality. In addition, they include anxiety about the way we think in megabytes rather than pages and in treating bits of information as discrete. There is concern as to whether productivity is increased or the standard has only changed upwardly. There is anxiety over "piecemeal publications" where it so easy to manipulate files and data with a personal computer. Finally, there is concern about quality of publications and ways of writing or thinking--whether they have "unlearned" important things about writing, they are too caught up with the "instant fix" possible, or quantity is replacing quality.

Nearly half the participants use telecommunications on a regular basis--for research, correspondence, work, play, and simple communication. The majority of the time, they use

their personal computers for stand-alone activities--either using word processing, spreadsheets, data bases, graphics, games, or desktop publishing. They are in awe at what both they and their personal computers can do and frequently consider all their activities to be "play."

CHAPTER V  
CONCLUDING STATEMENTS

CONCLUSIONS

There were three guiding questions for this narrative inquiry study. Each will be discussed in light of the results which came out of the study, along with unexpected themes which emerged. The data presented in the narrative are dialogic tests of the guiding questions.

The first, and central, question considered if there are instances in which personal computers provide creative or aesthetic experiences for the computer users in the study and what common themes emerged from them. The data support that personal computers do in fact assist, and sometimes stimulate, creative or aesthetic pursuits for these participants. Their own words support this conclusion where they say that their writing has improved, that there are qualitative differences possible with personal computers, and that there is a whole new aesthetic which has developed with the desktop publishing and rendering programs.

Those who create learning programs, graphics, or music affirm that the personal computer can assist or stimulate creative activities that would not be possible otherwise. They say that they have greater artistic ability and range of

expressions with effects they could not do manually, e.g., gradations from lightness to darkness as well as clear and sharp outlines. One has the ability to play a multitude of instruments--but only with the electronic keyboards, MIDI equipment, and his personal computer. Another has the ability to produce programs with a Macintosh and Hypercard which combines multiple disciplines such as history, culture, vocabulary, and art while making the learning experience interesting to his students. These programs are stimulating to the students' learning process as was expressed to the writer by a student in one of his classes.

The idea of a new aesthetic is intriguing and bears further contemplation. Aesthetic experiences include those which provide a deep sense of satisfaction in the perception of beauty, perhaps particularly in the beauty of one's own creations. Bob says that he has seen "bad computer art" but, on the other hand, he has seen "very good computer art." The researcher's sense of what is truly the new aesthetic in this case is that the participant's own perception of what is beautiful in his design work has changed and is driven by his ability to "find exactly the right design." The latter gives him a great sense of satisfaction in his work, to the point that he is prouder of what he can create with the PC. The comparison of the changing appreciations in styles of art such as from realistic painters to impressionistic painters to modernistic painters comes to mind. These are highly



individualistic appreciations for art, yet each has had it's own period of acceptance. Bob is indicating that computer graphics are a new era of aesthetic experiences for graphic designers. In addition, one has only to watch advertisements and introductions to television programs to realize that we both expect and appreciate much "glitzier" productions of the same in today's technological world.

The second question concerned patterns of use in which personal computers are a component of liberating experiences for the computer user. Associated with this were uses which were related to the class or size of computers and type of software. The place of use and access may be a debilitating effect at times since all do not have a PC on their desk at UNCG, but they succeed in minimizing that effect, through their own efforts. Liberating experiences imply those which result when one has autonomy over one's own life, thus where an internal locus of control is the central issue. All of the participants feel that they have more control over their lives, whether at work or at play, due to their personal computers. All do things they feel the PC enhances and enables. Those who write, especially Kerrie, would find it very difficult to do the volume of writing which they can do with a PC. For Kerrie, the personal computer is a facilitator. These liberating experiences for other participants include producing materials which would be impossible without the personal computer, e.g., some of the

programs for students or manuscripts which provide multiple types of encounters for students.

Arnold's ability to play back and print music as well as become other "instruments of music" offers him both educational and professional opportunities that "would be closed doors" to him otherwise. With little keyboard technique, he can prepare accompaniments which include an assortment of musical parts. He can also create music and both see and hear the results immediately, which provides him with immediate feedback.

Perry has the ability to create an engrossing and interdisciplinary look at culture, history, and vocabulary in three dimensional representations--something he thinks a book cannot do. Perry says that there are things he can do in writing his books and in preparing materials for his students that are qualitatively different from other things he can use. He particularly likes the ability and the freedom to prepare things which are non-hierarchical and which use "interdisciplinary approaches." His students can choose the order of their learning, can move around at will, and can omit sections they do not need. He is also freed from having to submit manuscripts which require the addition of art and other components by the publisher with only a description or sketch. This process required extensive review and change, something which is time consuming. Now he can do it himself. Perry and

Arnold have a partnership between themselves and their personal computers.

The perception is that this group of participants employs personal computers primarily because of the autonomous use which is possible. These individuals do not use mainframes for creative purposes. However, both personal computers and mainframes can be liberating and creative in one respect or another. Personal computers are liberating as described above and supported by the various narratives in the previous chapter. Mainframes, when connection is achieved through their personal computers, offer the participants the opportunity to expand their "immediate" circle of peers and reap the benefits of their knowledge, find support for various needs, and play.

Control is a significant phenomenon for the participants and is more than likely a primary impetus for their getting involved with personal computers in the first place. They say outright or strongly indicate that the control is important to them, that the control and editing ability help them do their work. They like the control they have over their work, the lack of dependence upon anyone else, and the ability to present final products which look exactly as they have envisioned. This is demonstrated in their own words when they repeatedly indicate that the most positive impact of personal computers on their lives is control, an internal locus of control.

Though these individuals view themselves as being autonomous and can use a variety of supports to accomplish tasks, the PC makes a difference in their lives. The personal computer, by its very nature, is more likely to induce these phenomena than are other "tools" and to facilitate a quicker process and higher quality product. This is supported by the findings of several sources as was discussed in Chapter III. Turkle found that the personal computer has enormous "holding power" and fascination for the user. Perkins echoed this when he said that computers are the most flexible "symbolic medium" which has ever been available. The participants support the idea that the personal computer has stimulated them to greater efforts, for example, giving them the feeling that they must work or improve whatever they create and providing them with interactive experiences. Their words also indicate that the PC makes it become play.

It seems that those who use the personal computer only at the initiation of someone else will be less likely to have these same experiences. Most indicated that it was directly related to whether they wanted or had to do something. Someone who only manipulated word processing documents or data bases that were created by others had little to say about these matters. This negative reaction was demonstrated by various interviewees in a number of ways. Some described the stress of a deadline as an external control. Others described the hesitancy in learning new programs as it generally meant

more work. A professor had to convince his students that using a PC to write their autobiographies for class would not mean more work, it simply freed them to enhance as their memories emerged. The result in his eyes is a longer, but definitely better, autobiography.

There is some serious concern with several participants regarding the potential of personal computers for further sorting of students. One wonders what would happen if we followed Bork's advice and provided personal computers to groups of students from all socioeconomic and racial backgrounds and observe the results in a longitudinal study. To reiterate and reapply what one participant said about personal computers, we should never underestimate what people can do--they will never cease to amaze us.

It appears that all participants lose track of time when using a personal computer, though it appears that the locus of control is the significant factor. One speculates whether they lose track of time more because they are using the computer or whether these people can lose track of time in anything they do. The sense is that these people can become engrossed in many things and is supported by their own statements and surveys when they say they become so captivated that hours can pass before they are aware. This definitely occurs during their use of personal computers but also when they are engaged in activities of their choosing such as

crafts, hobbies, concerts, and other leisure or work time activities.

The third guiding question for the study involved avenues for utilization of PC's to assist humans in creative activities or to provide free time through the ability to complete functions more quickly. Some use the PC for creative activities, such as developing manuscripts or programs or producing music. Several say that there is a distinct difference between hypermedia or Hypercard capabilities for the individual to create materials. Even if they do not often have the same feelings when using their PC's as when working with crafts or attending concerts, they all agree that time is saved. Therefore, there should be more time for other pursuits. Most state emphatically that they could not possibly complete all their tasks--either their own products or those necessary for the University--without their computers. One would seriously have to question the possibility of an individual completing two books in one year by any other means.

Additional themes emerged from the study, especially in their learning styles, rising expectations, and playfulness. Their own learning styles drive their new acquisitions and the development of their own creative products. The participants would like the materials they develop to be available to many types of personal computer users and have certain criteria in mind for their products. They prefer their products to be

very user oriented and allow students to work independently. One says he wants a very "fluid territory" where the students can go where they want with no excess baggage, no priorities, no hierarchies. Another says that he wants variability in learning exercises for students. He means variability and planning so they obtain immediate feedback. These mirror many of their self interests in learning and those presented previously as regards adult education.

Another factor in learning style is that the participants have learned to use personal computers on their own. This sustains one finding in the Spuck study, though a difference here is that these individuals most definitely use their computers. There are some lessons for educational programs in the information they provided. They particularly like interactive programs and doing things when they want to. They want software to be logical and consistent. In most cases, they want software to be challenging, meaning that as they become more sophisticated users, they want more complicated software.

Rising expectations was another emergent theme. Everyone expects a great deal out of themselves and realize that the expectations of others are significantly higher. They accomplish more with their personal computers than before and realize that external expectations demand they continue to do so. They also expect better quality appearance, more originality with the PC capabilities for fonts and desktop

publishing, and more accuracy with the ease of editing. Their views for the future of the technology are also connected to the theme of rising expectations where they want more power, memory, and speed--in a smaller package.

Kerrie's idea of credit-sized cards to obtain library books through the window machine, though an ingenious idea, is reminiscent of "disposable culture" and suggests the need for caution. Networking through mainframe computers and CD-ROM disks for PC's offer easy and frequent access, though expense is certainly a concern. One participant said "Let books be books." There is room for both books and personal computers in our culture and we should not force the technology to be something which it is not. We need to understand the technology for what it really is and can do with us. This speaks to the concern of a number of authors and the writer that the technology needs be appropriately used.

Playfulness was another major theme which developed and which was discussed in Chapter III as related to creativity. The participants seem to share the enjoyment of learning to use new computer programs of any type--whether a graphics, game, or functional program. They bring a sense of playfulness to their computing experiences. They enjoy the challenge itself, especially being able to get something that is either difficult or unexpected to work. They frequently exhibit this sense of playfulness when they say "WOW, that's really neat."



One participant voiced the opinion that men and women view using personal computers differently and that men feel like saying "WOW, that's really neat" more often while women more frequently view the PC as a tool. A related phenomenon emerged. The two female participants in the final descriptive stage of this study both said, and prove by their actions, that they do "other than girl things." They say they have always been interested in doing things, including those that were usually male oriented. They say things like, "Oh, that's really neat!" A consideration is that PC users who experience a sense of playfulness and enjoyment when using the computer have a general sense of adventure. The various activities in which all of the participants are involved, as demonstrated on the survey they returned and in the interviews and presented in Table 5, support this conclusion.

There are programs available which combine many aspects of the major themes in this study. The rendering programs which several participants discussed offer a number of advantages to our world. The possibilities in manufacturing and marketing are enormous. This capability offers potential savings to individuals and businesses with the facility to know how something would look in a given texture and color. As Bob was able to find the right design, so can the public find what really suits them or fits their needs, e.g., in purchasing furniture by applying different fabrics and having a printed rendition to take home and compare. Another

scenario would be the ability of a company to determine what a final product will look like before expending so much on manufacturing costs. This also offers a designer the opportunity to match shape, texture, and intentions of use to find a best fit.

On the whole, these participants are actively utilizing the powers of personal computer technology to either make their work better or make it faster. On the side, they sometimes achieve another level of communication with the personal computer. When their work is better, they can create materials on their own which they could not do otherwise. When their work is faster, they can then spend the additional time on other activities, either alone or otherwise. The participants exemplify the manner through which PC's can be integrated with one's work and one's everyday life to make it better. As part of an educative environment, they would like to see the development of this technology to provide this level of enjoyment and liberatory support for all. They do not want to create an atmosphere of use where computers are unavailable or educative uses are not acceptable.

These participants seem to have taken charge of their lives when it comes to personal computing. Whether they have had to provide this support for themselves or not, they have taken the extra step that is needed to accomplish their goals.

## IMPLICATIONS

The study presented here is a beginning. There are many potentials for additional inquiry, some are outgrowths of these findings and others are related issues that surfaced. The data support that personal computers have profound influences in positive directions on the participants in this study.

One major recommendation stems from these findings, the studies by Progen, and the flow theory of Csikszentmihalyi. It would be a major study to investigate the sense of playfulness and lost sense of time during use of PC's and see how it relates to the flow experience. Csikszentmihalyi states that flow is possible in any activity. If the flow experience is possible when using personal computers, it offers a great deal of future exploration of this phenomenon in many areas.

Another study which could prove very efficacious would be one which looks at the personality variables that lead one person to use personal computers as a tool and another to go "Oh! That's really neat!" while looking at possible gender differences. This idea developed during an interview after the researcher had made reference to the way different people interact with things like computers. Related issues to that study could also include the lost sense of time, whether female attitudes have changed in this regard over the past few

years, and whether boys do in fact prefer violent computer games.

An additional study which could have serious implications would investigate the ways in which secretarial personnel use personal computers as compared to faculty and staff at the University. One wonders how many secretaries utilize personal computers for pure enjoyment or during any leisure-time activities or whether they feel unempowered to such an extent that they choose not to use them at all.

A significant study which could have broad effects would be to look more definitively at how personal computers affect writing and thinking--both process and product. This could provide knowledge that would greatly affect educational and private uses of personal computers. A personal conclusion is that personal computers offer far more advantages in this respect than they offer disadvantages.

Other ideas which merit further study involve the compression of time, the relationship between personal computers and productivity as related to making more work, and the rising expectations of self and others which seem to be an effect of personal computers. It appears that rising expectations have the effect of compression of time and that our society seems to exhibit a lot of this. The participants do not feel that their altered perception of an accelerated sense of time is a negative, i.e., when they lose track of time and feel that only minutes have passed. This phenomenon

has occurred with other technologies in the past, e.g., the automobile replacing the horse and buggy. One wonders what we will think of all this in another fifty years. On the other hand, they have a contradiction when considering the effects on themselves when others expect them to complete tasks much more quickly.

Marcuse expressed the possibilities of technology to free humans while he deplored its uses, though he knew nothing of personal computers at the time. He proposed that complete automation which met all our required needs would result in opening "the dimension of free time as the one in which man's private and societal existence would constitute itself" and this would be a "historical transcendence toward a new civilization." He did not believe that liberty could erupt from the degradations of poverty. He said that qualitative change in the use of technology can provide for a "new human reality" which would make man "free for the art of living" and provide a new technological reality. Marcuse said that "the idea of 'inner freedom' here has its reality: it designates the private space in which many may become and remain 'himself.'" <sup>1</sup> The possibilities of personal computers as a human-size technology to facilitate a liberatory education and autonomous work offer the prospect of a qualitative difference in the use of computing technology.

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<sup>1</sup>Marcuse, 10, 36-37, 227-231.

Personal computers appear to offer a more intriguing way of providing educative experiences in cases where the power and abilities of the PC can be of benefit. Hegemony and reification were defined and the effects of schooling were presented in a previous chapter. Ira Shor and Paulo Freire wrote a "talking book" in which they discuss the present educational system which attempts to present an "official curriculum." They agree that students are essentially resisting this curriculum, leaving school teachers and administrators extremely frustrated at their efforts to maintain. They propose liberatory education as an avenue to provide meaningful, dialogic education for the students. Though they do not mention computers to any extent, given the ideas presented within this study, the personal computer could very well assist in providing avenues for such education. Students are generally interested in using computers and PC's offer the opportunity for greater enjoyment. In all fairness, the same thing happens with a liberating educator--even in a lecture.<sup>2</sup>

One must be free to be creative. Personal computers have an effect in creative activities as demonstrated by the participants' stories. However, there is more to this. Creativity does not happen instantly, rather requiring experience and nurturing. Goetz says that,

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<sup>2</sup>Shor and Freire, 1-7, 40-44.

... , if one wants a child to have a disposition toward creativity, that is, to respect, admire, and enjoy creative behavior and be desirous of participating in the creative process, one needs to train this disposition.... An open line of communication across the home, school, and community settings will keep the child's climate supportive of that child's creative efforts, which should then generalize from one setting to the other.<sup>3</sup>

We should provide the autonomy to be creative and we should nurture the creativity. It is there, in the area of personal computers, where people have feelings of awe and say "I can't believe it did that!!" or "WOW! That's really neat!" It is there in the areas that allow them to do more or differently than they thought possible.

It is appropriate to remember that one participant who referred to a "new aesthetic" which has developed as a result of desktop publishing and computer-assisted design, says that the first time he used a sophisticated desktop publishing program on his Macintosh, he entered the word "ART." The word "technology" derives from the Greek "technologia" which means "systematic treatment of an art."<sup>4</sup> One hopes that we seek to find the right design for this technology as we move toward greater use and availability of personal computers. Since it is possible for these participants to use personal computers

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<sup>3</sup>Elizabeth M. Goetz, "The Teaching of Creativity to Preschool Children," Chapter 23 in Glover, 425, 426.

<sup>4</sup>Webster's New Collegiate Dictionary, (Springfield, MA: G. & C. Merriam Company, 1974).

in liberating and creative ways, it is presumably possible for others. We need to plan for the future, in order to preserve this technology and to promote qualitatively better use.



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**APPENDIX A**

## TOPIC/QUESTION LIST FOR INTERVIEW

INTERVIEW NO: \_\_\_\_\_ PSEUDONYM: \_\_\_\_\_  
 Consent: \_\_\_\_\_ CODE: \_\_\_\_\_  
 Location: \_\_\_\_\_ Time: \_\_\_\_\_ Date: \_\_\_\_\_

Introduction self, purpose, how chosen, confidential.  
 Notes on Room, etc.

- You've used \_\_\_\_\_ computers at \_\_\_\_\_.  
 How often do you use? \_\_\_\_\_ How long at time? \_\_\_\_\_
- You've used a computer for \_\_\_\_\_. What types of uses do  
 you prefer? Why? Size, brand, software, manuals.
- Do you ever lose track of time when using comp.? When?
- Describe how you feel when using \_\_\_\_\_ computer.  
 \_\_\_\_\_ Software. Any differences?
- You purchased a(n) \_\_\_\_\_. Why? Why that brand?  
 Did you get what you really wanted? Why/why not?
- When you purchased your computer, did you set it up or  
 have someone do it? Have you installed any additional  
 component or board? Would yo like to? or did you have  
 any problems? How did you feel?
- What types of software would you most like to try that  
 you haven't used before? Why?
- What types have you used that you hated? disliked? loved?
- Do you perceive any differences between large computers  
 and personal computers?
- Describe the most negative impact computers have had on  
 your life.
- Is there any difference between larger computers and  
 personal computers in this respect?
- Describe the most positive impact computers have had on  
 your life.
- Is there any difference between larger computers and  
 personal computers in this respect?
- Whom do you think is in "control" when you're using a  
 computer?



- Is there any difference between the type of computer?
- When do your best feelings occur during the use of a computer? Your worst?
- What are some of your leisure-time activities?  
Part? Spec? Feelings? When best? worst? describe
- What leisure time activities would you most like to do?  
How is it different from the others?
- Have you ever felt totally submerged within any activity?  
Describe what, when, how.....
- Has this same happening occurred when you were using a computer? Which one? What were you doing? How many times?
- What do you consider to be the most creative thing you do? The most aesthetic?
- When do you most feel in control? What? Where?
- Do you experience this with computers? When? Where?
- When do you feel powerless? What? Where?
- Do you experience this with computers? When? Where?
- What do you visualize in the future for computer technology?
- What would you like to see?
- How would you get along if computers were to suddenly disappear?
- Miscellaneous questions depending on flow of conversation.

**APPENDIX B**

PROBE QUESTION IDEAS -- FROM ADAMS RESOURCE

INTERVIEWER PROBES

Completion Probes -- obtain more info on general/vague response

Anything else?            Could you tell me more about that?  
 What else can you think of?  
 Does anything else come to your mind?

Clarity Probes -- elicit additional information. Seek explanation.

I don't quite see what you mean.  
 Could you explain that a little more? Give an example?  
 Why is that? Could you explain what you mean by \_\_\_?

Channel Probes -- uncover or trace back. Distinguish between original and adopted opinion, as well as to specify source of.

Where have you heard that?  
 Whom do you mean by 'they?'

Hypothetical Probes -- use w/ care. Use when response implies an alternative condition or state of affairs. "Well what if they broke w/ Russia?"

Reactive Probes -- elicit affective reactions or feelings to situations mentioned by the respondent.

How do you feel about disciplining children?  
     We firmly believe children should be punished.  
 How do you personally feel about punishing children?  
     I hate it myself.

High-Pressure Probes -- use cautiously. Only when strong rapport.

Is that what you really think?

NOTE: Do not suggest response.

**APPENDIX C**

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Institutional Review Board  
Notification FormDATE: Feb. 26 1990PROJECT TITLE: Personal Computers & the LiberatingAspects for Human CreativityPRINCIPAL INVESTIGATOR: Wayne W. ScottSCHOOL/COLLEGE: Ed. DEPARTMENT: Cur. & Ed. Found.

## ACTION TAKEN:

- Exempt  
 Expedited Review  
 Full IRB Review

## DISPOSITION OF APPLICATION:

- Approved  
 Disapproved

## MODIFICATIONS:

Lucy B. Nalley  
IRB Chair/Designee

Approval of research is valid for one year unless otherwise indicated. If your research goes beyond one year, the project must be reviewed prior to continuation.

**APPENDIX D**

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## LETTER AND FORM TO SOURCES OF PARTICIPANTS

January 22, 1990

Dr.....

Dear Dr.....:

My doctoral dissertation at the University of North Carolina at Greensboro is focused on the liberating and creative uses of personal computers by adults who are affiliated with UNC-G. I am requesting your assistance in identifying potential participants for the study. Those you identify will receive a survey form to complete and participants for the interview process will be selected from these completed surveys.

I am interested in meeting with people who are at least 20 years of age and who use personal computers in some way which is enjoyable or satisfying (at home, work, or UNC-G). All who agree to participate in the study will be asked to sign a consent form and will be granted confidentiality of their survey and interview information.

Please write the names and any available contact information on the attached sheet and return it to me in the pre-addressed, pre-stamped envelope. Please return this to me at your earliest convenience, but preferably no later than January 31, 1990, in order to maintain the necessary schedule for the study.

Your assistance is greatly appreciated and I think you in advance for your support of this project. I shall be delighted to share results of the study with you following completion of the dissertation.

Sincerely,

Gayle W. Scott

RETURN TO:

Gayle W. Scott  
\_\_\_\_\_  
\_\_\_\_\_POSSIBLE PARTICIPANTS IN STUDY ON LIBERATING/CREATIVE USES OF  
COMPUTERS AT UNC-G:

Please list the names and any contact information you have available. If you have no telephone or address available, their status (student, staff, faculty) at UNC-G should allow me to contact these people. A pre-stamped, pre-addressed envelope is included.

NAME: \_\_\_\_\_ TELEPHONE: \_\_\_\_\_  
ADDRESS: \_\_\_\_\_

UNC-G (CHECK ONE) \_\_\_\_\_ STUDENT \_\_\_\_\_ STAFF \_\_\_\_\_ FACULTY

NAME: \_\_\_\_\_ TELEPHONE: \_\_\_\_\_  
ADDRESS: \_\_\_\_\_

UNC-G (CHECK ONE) \_\_\_\_\_ STUDENT \_\_\_\_\_ STAFF \_\_\_\_\_ FACULTY

NAME: \_\_\_\_\_ TELEPHONE: \_\_\_\_\_  
ADDRESS: \_\_\_\_\_

UNC-G (CHECK ONE) \_\_\_\_\_ STUDENT \_\_\_\_\_ STAFF \_\_\_\_\_ FACULTY

NAME: \_\_\_\_\_ TELEPHONE: \_\_\_\_\_  
ADDRESS: \_\_\_\_\_

UNC-G (CHECK ONE) \_\_\_\_\_ STUDENT \_\_\_\_\_ STAFF \_\_\_\_\_ FACULTY

NAME: \_\_\_\_\_ TELEPHONE: \_\_\_\_\_  
ADDRESS: \_\_\_\_\_

UNC-G (CHECK ONE) \_\_\_\_\_ STUDENT \_\_\_\_\_ STAFF \_\_\_\_\_ FACULTY

NAME: \_\_\_\_\_ TELEPHONE: \_\_\_\_\_  
ADDRESS: \_\_\_\_\_

UNC-G (CHECK ONE) \_\_\_\_\_ STUDENT \_\_\_\_\_ STAFF \_\_\_\_\_ FACULTY

NAME: \_\_\_\_\_ TELEPHONE: \_\_\_\_\_  
ADDRESS: \_\_\_\_\_

UNC-G (CHECK ONE) \_\_\_\_\_ STUDENT \_\_\_\_\_ STAFF \_\_\_\_\_ FACULTY



APPENDIX E

## LETTER AND PRELIMINARY SURVEY

February 9, 1990

Dear .....:

I am a doctoral candidate at the University of North Carolina at Greensboro, completing a degree in education. My dissertation research is an investigation of the potential for liberating and creative experiences with the use of personal computers.

The purpose of this letter is to request your participation in this study. Your name has been provided to me by a faculty or staff member at UNC-G who feels that you might be an individual who enjoys using computers. Your role in this study, should you agree to take part, consists of two steps: the completion of a brief survey and participation in an interview. The survey is enclosed and should take approximately 15 minutes to complete. I will use the survey to select the individuals who take part in the interview phase. The interview will take approximately 1 hour to complete and I will make every effort to schedule the meeting at your convenience. A tentative interview schedule between March 1 and April 20, 1990 is being arranged.

Your participation in this study is entirely voluntary. The procedures being used in this investigation comply with the ethical standards of human subject research and meet the approval of the School Review Committee of the UNC-G School of Education.

Please complete the enclosed survey and return it to me in the pre-address, pre-stamped envelope at your earliest convenience, but preferably by February 20, 1990, in order to maintain the necessary schedule for the study. Your cooperation in this project will contribute to the quality of the research. Thank you for your time and consideration. I will be happy to answer any questions you might have and you can reach me at the address or telephone listed below.

Sincerely,

Gayle S. Scott

---

## SURVEY ON USE OF PERSONAL COMPUTERS

RETURN TO:

GAYLE W. SCOTT  
ADDRESS/PHONE GIVEN

PLEASE COMPLETE THE FOLLOWING QUESTIONS. THE RESULTS WILL ALLOW ME TO SELECT THOSE WHO WILL BE ASKED TO PARTICIPATE IN AN INTERVIEW FOR A DOCTORAL DISSERTATION STUDY. ALTHOUGH YOUR NAME AND TELEPHONE NUMBER IS NECESSARY, ALL INFORMATION WILL BE HELD IN STRICT CONFIDENCE. ONCE YOU HAVE COMPLETED THE SURVEY, PLEASE RETURN IT IN THE PRE-ADDRESSED, PRE-STAMPED ENVELOPE.

[Mailing Label]

AGE: \_\_\_\_\_

SEX: \_\_\_\_\_

PHONE (D): \_\_\_\_\_

PHONE (N): \_\_\_\_\_

1. What type of computers do you use or have you used? Check all that apply:
  - a. Large computers such as
 

IBM	_____
VAX	_____
DEC	_____

Other (specify) \_\_\_\_\_
  - b. Personal computers such as
 

Apple	_____
IBM	_____

Other (specify) \_\_\_\_\_
2. Where do you use these computers? Check all that apply:
 

Home:	_____	Work:	_____
Other (specify): _____			
3. How long have you used a personal computer?
 

One week to 2 months	_____	More than 2 years	_____
2 to 6 months	_____	More than 3 years	_____
6 months to 1 year	_____	More than 4 years	_____
More than 1 year	_____	More than 5 years	_____
4. Do you own a personal computer? Yes \_\_\_\_\_ No \_\_\_\_\_
 

If yes, what brand/model? \_\_\_\_\_

When did you purchase? \_\_\_\_\_
5. For what purposes do you use a personal computer? Check all that apply:
 

Word Processing	_____	Print Shop Uses	_____
Spreadsheets	_____	Desk Accessory	_____
Data Bases	_____	Draw Programs	_____
Games	_____	Desktop Publish.	_____
Other (specify) _____			

6. Indicate which types of feelings you have when using computers. Check all that apply and indicate when you have these feelings (e.g., what type of use).

Happy	_____	When:	_____
Good	_____	When:	_____
Excited	_____	When:	_____
Afraid	_____	When:	_____
Frustrated	_____	When:	_____
Unhappy	_____	When:	_____

7. A beginning list of leisure-time activities follows. Please mark any that you enjoy, whether as a participant (part.) or a spectator (spec.). Also, please list specific activities which are of interest to you within these categories. Feel free to add your active leisure pursuits.

	Spec.	Part.	Specific Activities
Constructive Crafts	_____	_____	_____
Team Sports	_____	_____	_____
Individual Sports	_____	_____	_____
Visual Arts	_____	_____	_____
Music (list./play)	_____	_____	_____
Visiting Places	_____	_____	_____
Photography	_____	_____	_____
Dance	_____	_____	_____
Drama	_____	_____	_____
Other Outdoor Act.	_____	_____	_____
Walking/Jogging	_____	_____	_____
Gardening	_____	_____	_____
Aerobics	_____	_____	_____
Other Activities	_____	_____	_____

8. How has your use of computers changed over the past 5 years?

NOTE: IF YOU KNOW OF ANYONE AFFILIATED WITH UNC-G WHOM YOU THINK WOULD BE A GOOD CANDIDATE FOR PARTICIPATING IN THIS STUDY, PLEASE SO INDICATE ON THE FOLLOWING PAGE. THANK YOU AGAIN FOR YOUR PARTICIPATION.

Please provide the name and contact information of anyone affiliated with UNC-G whom you think would be a good candidate for participating in this study. If you have no contact information, their status at UNC-G should allow me to contact them. Thank you.

NAME: \_\_\_\_\_ PHONE: \_\_\_\_\_  
 DAY \_\_\_\_\_ NIGHT \_\_\_\_\_  
 ADDRESS: \_\_\_\_\_  
 UNC-G STATUS: \_\_\_\_\_ STUDENT \_\_\_\_\_ STAFF \_\_\_\_\_ FACULTY

NAME: \_\_\_\_\_ PHONE: \_\_\_\_\_  
 DAY \_\_\_\_\_ NIGHT \_\_\_\_\_  
 ADDRESS: \_\_\_\_\_  
 UNC-G STATUS: \_\_\_\_\_ STUDENT \_\_\_\_\_ STAFF \_\_\_\_\_ FACULTY

NAME: \_\_\_\_\_ PHONE: \_\_\_\_\_  
 DAY \_\_\_\_\_ NIGHT \_\_\_\_\_  
 ADDRESS: \_\_\_\_\_  
 UNC-G STATUS: \_\_\_\_\_ STUDENT \_\_\_\_\_ STAFF \_\_\_\_\_ FACULTY

NAME: \_\_\_\_\_ PHONE: \_\_\_\_\_  
 DAY \_\_\_\_\_ NIGHT \_\_\_\_\_  
 ADDRESS: \_\_\_\_\_  
 UNC-G STATUS: \_\_\_\_\_ STUDENT \_\_\_\_\_ STAFF \_\_\_\_\_ FACULTY

NAME: \_\_\_\_\_ PHONE: \_\_\_\_\_  
 DAY \_\_\_\_\_ NIGHT \_\_\_\_\_  
 ADDRESS: \_\_\_\_\_  
 UNC-G STATUS: \_\_\_\_\_ STUDENT \_\_\_\_\_ STAFF \_\_\_\_\_ FACULTY

NAME: \_\_\_\_\_ PHONE: \_\_\_\_\_  
 DAY \_\_\_\_\_ NIGHT \_\_\_\_\_  
 ADDRESS: \_\_\_\_\_  
 UNC-G STATUS: \_\_\_\_\_ STUDENT \_\_\_\_\_ STAFF \_\_\_\_\_ FACULTY

APPENDIX F

## CONSENT FORM

The object and implications of this study have been explained to me. I agree to be interviewed for this dissertation study, to have the interview taped, and to have the results of the interview analyzed and included in the dissertation. I understand that all information provided shall be kept confidential and treated ethically, according to the guidelines for ethical research of the School of Education at UNC-G. Though my name appears below, I understand that any information utilized from the survey or interview shall be documented with a pseudonym.

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

APPENDIX G



## GLOSSARY

- ASCII -- American Standard Code for Information Interchange.  
A seven-bit code.
- Beta Testing -- Testing of software to detect failures or "bugs" for a company prior to release of that software.
- Bugs -- An error in a computer program.
- Bulletin Board -- A telecommunications networking unit into which individuals can connect and leave messages; various boards are restricted to specific interests.
- Byte -- A unit of 8 binary bits. One byte represents one character or numeric value (0-255).
- Code -- A particular set of symbols which represents data.
- DOS -- Disk Operating System, for the personal computers.
- E-Mail -- Electronic Mail, mail that moves via the mainframe computer such as the VAX. Can be initiated from a terminal or a personal computer with a modem. Each individual who uses the system has a mailbox.
- Floppy Disk Drive -- A device which can read data stored on a floppy disk, usually 5-1/4 inch in size.
- Font -- A characteristic set with type style for personal computers, e.g., Courier, 10 point, 10 pitch.
- Hacker -- A computer user who is generally very knowledgeable, and, in today's terms, often attempts to break into other computers.
- Hard Drive (Hard Disk, HD) -- A large capacity disk drive which is enclosed in the computer or free-standing and has a non-removable hard disk.
- Hardware -- The non-disposable parts of a computer system, including the central processing unit/system board, monitor, printer, keyboard, modem, etc.
- Laptop Computer -- A small, portable computer which usually weighs 20 pounds or less.

**Logon** -- To initiate communication with a mainframe computer, usually requiring several levels of code entry, e.g., account number and password.

**Macros** -- Functions which can be set up in a personal computer to perform frequently used functions with one or two keystrokes, e.g., a macro to enter a frequently used phrase.

**Megabyte** -- One million bytes of information.

**Megahertz** -- One million hertz. A hertz is a unit of frequency that is equal to one cycle per second.

**MIDI** -- A musical equipment computer interface that can record music and subsequently play it back.

**Modem** -- A modulator/demodulator which converts between digital and analog signals.

**Mouse** -- A device which, when moved on the surface near a computer, moves an icon or pointer on the computer screen. It can be clicked to select functions.

**MS-DOS** -- Microsoft DOS. Primary DOS system used by IBM-compatible computers.

**Network** -- A group of computer users communicating with each other with computers, modems, and telephone.

**Networker** -- One who uses a network for communication.

**ProDOS** -- One of the Apple Computer Corporation operating systems.

**RAM** -- Random Access Memory. Memory in a computer which can be accessed without having to read any previous records.

**Software** -- Programs that are written for computer systems.

**Sysop** -- System operator. The person who monitors and sometimes controls functions on a mainframe or network.

**User Interface** -- The software and functions that produce the visible screens on a computer program to the computer user, e.g., MacIntosh pull-down menus with icons.