Toward a History of Social Computing: Children, Classrooms, Campuses, and Communities

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During the spring of 1970, Valarie Lamont wrote a computer program to stimulate local environmental activism.[1] By deploying text and images in her program to present the history of the Boneyard Creek, which ran through the communities of Champaign and Urbana, Illinois, Lamont created a compelling narrative about the stream's flooding and pollution problems and potential solutions. As a political science graduate student at the University of Illinois at Urbana–Champaign (UIUC), Lamont investigated citizen participation in community planning, and she produced a program for that purpose. The users of her program—civic leaders, media representatives, local residents, faculty, and students—navigated the narrative by operating the keyboard located below the video screen at their individual terminals. The users gathered information about unfamiliar terms, viewed photographs of the creek and its pollution, expressed their preferences for solutions to the pollution, and provided their comments and opinions to Lamont at any point along the way.[2] Lamont and the Boneyard Creek program users worked on a computing system at UIUC known as PLATO (Programmed Logic for Automatic Teaching Operations), a system that by 1970 featured more than 70 terminals on the UIUC campus and at other locations throughout the state.[2] Lamont later explained that her programming choice stemmed directly from the community's existing concern for environmental issues, concern that had been expressed locally and nationally during the first Earth Day events of that same spring.[3]

Studying Lamont's Boneyard Creek program illustrates how Lamont and her peers at UIUC employed the PLATO system for personal and social computing, specifically as an activist method to educate citizens about and draw media attention to the problems plaguing the stream. Indeed, Lamont is representative of the individuals I address in my dissertation, "Personal Computing before Personal Computers." I argue that students and educators using academic time-sharing systems during the 1960s and 1970s transformed computing from a business, military, and scientific endeavor into an intensely personal practice. These time-sharing systems included PLATO, the Dartmouth Time-Sharing System, and several education-centered projects in Minnesota, including the Minnesota Educational Computing Consortium. The users of these systems popularized the now-ubiquitous activity of sitting in front of a keyboard, typing, and responding to messages appearing on a text-oriented display. These students and educators also created communities to support their computing practices, and they fostered social computing.

Rethinking Social Computing

By social computing, I do not mean the recent academic discipline of using software to facilitate social interaction, nor am I referring to particular computing networks such as bulletin board systems (BBSs), the Internet, or Facebook. Rather, I employ the phrase "social computing" to emphasize the social connections forged around and with computing use. We commonly think of computing in individual terms—the lone programmer or hacker, the personal computer, and the user—yet the practice of modern computing has always involved groups of people. From the heterogeneous team of men and women who assembled and programmed the ENIAC computer, to the MIT engineers who gathered around a screen to play *Spacewar,* to the high school students who programmed PLATO, modern computing has involved the interactions of many people, along with their cultural norms, values, and expectations.

The discipline of the history of computing emerged under the paradigm of the personal computer during the 1970s and 1980s. The *Annals of the History of Computing* first appeared in 1979. Classic works such as the mathematician Herman Goldstine's biographical history and the historian Paul Ceruzzi's *Reckoners* appeared during this time.[4,5] The journalist Steven Levy's best-seller *Hackers* cemented the history of computers (at the time) as a history of machines and the great men who built them.[6] Indeed, many of us have watched the uptake of the personal computer, have witnessed the cults of personality around Bill Gates and Steve Jobs, and have employed a once-new Internet to our great convenience (or frustration, or both). The history of computing has expanded greatly since then, of course, as historians have examined topics ranging from the history of software to the history of women in computing to the gendering of the computing profession.[7] But the personal computer—and the associated elevation of the individual—still drives our discourse.

We historians have only begun to address how people made computing ubiquitous. In an *Annals* Think Piece

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article published a decade ago, Nathan Ensmenger urged us to a social history of computing—that is, a history of the "many thousands of largely anonymous individuals who contributed to the development of this new social and technological environment."[8] I call for a history of social computing. Moving the adjective highlights the activity of computing as a social and cultural phenomenon. A history of social computing considers how computing has facilitated communication as well as computation. A history of social computing attends to the myriad human interactions that have shaped and supported our digital, networked world.

Why Education Matters

Technologies of education, such as the PLATO system, offer rich opportunities for the study of both personal and social computing. When the researchers at UIUC's military-defense-oriented Coordinated Science Laboratory initially created the PLATO system as an exploration of the potential uses of computing in education, they had users in mind from the beginning: students. In 1961 Donald Bitzer, Peter Braunfeld, and Wayne Lichtenberger reported on their new computing system, which featured a television screen on which prepared instructional materials were displayed to students as well as keysets (or keyboards) with which students could interact with the instructional materials, including typing responses and seeking additional information.[9] Bitzer and his colleagues developed the system with some mental model of "the student," a point which is not to be overlooked. Valarie Lamont also had some concept of her users in mind when she wrote her Boneyard Creek program. When an individual worked on a system or software, several types of communication occurred: between the individual and the computer, between the individual and her collaborators, and between the individual and her intended user.

When students began using the PLATO system, Bitzer and his team incorporated their feedback and their teachers' feedback into changes and enhancements to the system. Indeed, I must underscore the methodological value of studying systems that originated in an educational context. Because many of the project publications were oriented toward readers in education, they often included meticulous details of users' encounters with the terminal, the language, the lessons, the appropriate syntax, and similar issues. These reports documented knowledge and practices that otherwise would have been tacit and unnoticed. Such descriptions are immensely helpful for historians seeking to understand and describe novel computing experiences.

This research draws attention to the important but little studied area of the history of technology in education. The historian of technology Steven Lubar cogently declared, "We have downplayed the skill and knowledge required by users of technology, looking at the machine and not the task, looking for complex systems on the production side, not on the consumption side."[10] Although some historians have begun to address this lacuna by considering household or office technologies, historians are only beginning to study the "skill and knowledge required by users of technology" in schools.[11] An exploration of the history of computing in an educational context is particularly promising. In the case of interactive computing systems like PLATO, students and educators were some of the earliest groups of users, and they developed "complex systems" around time-sharing.

Studying technologies in educational settings also means studying children. Now it seems axiomatic that young people and digital technologies simply go together; for example, kids teach their grandparents how to use smartphones.[12] What is the history here? How has the relationship between children and technology changed over time? How have technology and the classroom shaped each other? In answering those questions, we historians of computing can engage in fruitful dialogue with others who study media, including radio and television, as well as scholars who consider the history and activity of play. We must grant young people agency as technological actors and study them. Children's classroom experiences shape both the children and the technology, with what I consider an accretion of technological exposure. For the K-12 students in New Hampshire, Minnesota, Illinois, and elsewhere who used time-sharing in the 1960s and 1970s, those early computing experiences were formative. Bill Gates had his first computing experience on a time-sharing system.[13] Moreover, students and educators were not simply consumers of time-sharing. My research demonstrates that they generated new knowledge about this form of computing, including writing numerous software programs and devising modes of communication and resource management.

Examining educational technologies also means considering their social setting,

whether the classroom, campus, or community. Indeed, although various forms of computing, ranging from mainframe computing to time-sharing to mini-computing, proliferated on university campuses during the 1960s through the 1970s, we know little about how individuals and groups used and responded to those computers.[14] Most historians have depicted the campus protests of the 1960s as a rejection of technology and technocracy.[15] A closer examination paints a different picture. Although Bitzer and his colleagues developed PLATO for military research, Lamont later deployed it to stimulate environmental activism. While Lamont was writing the PLATO Boneyard program, hundreds of UIUC students protested the installation of the Illiac IV computer on campus after they learned that the Department of Defense controlled most of the computer time. Shortly thereafter, on 2 March 1970, hundreds of students protested General Electric's on-campus recruiting, and the university administration called in the National Guard to enforce a curfew.[16]

For many UIUC students, PLATO represented personal computing and democracy. At the same time, Illiac IV symbolized the evils of the military-industrial complex and the Cold War. To better understand the nuances of American activism, protest, and politics during the 1960s and 1970s, and to understand the environments in which personal computing emerged, we must carefully attend to these contingencies.

References and Notes

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