



The Circulation of Computer Knowledge Beyond Schooling, 1980-2000

Online Workshop, 16th/17th September 2021



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Since the 1970s, widespread use of microcomputers has brought about significant changes to the industrialized world. The private and public sector have both been faced with new challenges and demand for new skills and knowledge relating to information and communications technology (ICT). Government officials, private stakeholders and educators at all levels have responded to the need to train citizens and employees in basic and advanced computer skills by designing educational programmes and vocational education and training tracks.

The responses of these actors to the challenges of computerization have already received attention from scholars (e.g., Cuban, 2001; Rolandsson, 2011; Saarikoski, 2011; Staube, 2015; Tatnall, 2015; Rankin, 2018; Thießen, 2019). However, significant numbers of people with computer expertise have acquired their knowledge and skills outside of the education system and ICT training courses provided by businesses and industry. Civil society associations, grassroots movements and spontaneously formed groups of self-taught people have significantly contributed to the creation, transmission and circulation of ICT skills and knowledge. There is already a variety of historical studies on user groups and networks that engaged in self-learning and dissemination of computer knowledge during the 1980s and 1990s in different geographical contexts, for example: the first users of family computers in France (Thiery, 2012); the role of computer clubs in the early years of microcomputers in Finland (Saarikoski, 2005); the hacker culture (Erdogan, 2018a, 2018b; Levy, 2010; Håpnes, 1996; Alberts and Oldenzien, 2014); hobby communities and young enthusiasts' acquisition of computer knowledge in the Nordic countries (Nissen, 1993; Reunanen and Silvast, 2009); and gaming culture in communist Czechoslovakia (Švelch, 2018).

This workshop aims to build on this knowledge and bring together different perspectives to broaden our understanding of the role of non-traditional educational actors which, independently of established educational and vocational training systems, took on the task of creating and disseminating computer knowledge during the period from the 1980s to the early 2000s. Computer clubs or youth camps, hacker groups, labour unions, women's and youth organizations – to name but a few – made dedicated efforts to provide their peers or certain stakeholder groups with opportunities to learn about computer technology. A common denominator among these groups was their ability to engage in computer learning and teaching primarily from a user perspective, without going through bureaucratic and sluggish processes; setting their own goals and rules, and focusing on the skills and knowledge that seemed most relevant and useful for their own purposes. Attending to the self-empowerment strategies and activities of these groups can shed light on questions of access to knowledge, power struggles, agency of disempowered groups and circulation of knowledge outside of traditional education and training structures, settings and regulations.

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References

- Alberts, G. & Oldenziel, R. (2014). *Hacking Europe: from computer cultures to demoscenes*. New York: Springer.
- Cuban, L. (2001). *Oversold and Underused. Computers in the Classroom*. Cambridge, MA: Harvard University Press.
- Erdogan, J. G. (2018a). Technologie die verbindet: Die Entstehung und Vereinigung von Hackerkulturen in Deutschland. In: *Wege in die digitale Gesellschaft. Computernutzung in der Bundesrepublik, 1955–1990* (pp. 227–249), ed. by F. Bösch. Göttingen: Wallstein.
- Erdogan, J. G. (2018b). Computerkids, Freaks, Hacker: Deutsche Hackerkulturen in internationaler Perspektive. In: *Let's historize it! Jugendmedien im 19. und 20. Jahrhundert* (pp. 61–94), ed. by C. Zimmermann & A. Maldener. Köln u.a.: Böhlau.
- Hyltén, B. & Nissen, J. (1993). *Dataintresserad ungdom i Sverige eller jakten på den svenska hackern*. Linköping: Univ.
- Håpnes, T. (1996). Not in their Machines: How Hackers Transform Computers into Subcultural Artefacts. In: *Making Technology Our Own? Domesticating Technology into Everyday Life* (pp. 121–150), ed. by M. Lie & K. H. Sorensen. Oslo: Scandinavian University Press.
- Levy, S. (2010). *Hackers*. Sebastopol, CA: O'Reilly Media.
- Rankin, J. L. (2018). *A People's History of Computing in the United States*. Cambridge, MA: Harvard University Press.
- Reunanen, M. & Silvast, A. (2009). Demoscene Platforms: A Case Study on the Adoption of Home Computers. In: *History of Nordic Computing 2* (pp. 289–301), ed. by J. Impagliazzo, T. Järvi & P. Paju. Berlin: Springer.
- Rolandsson, L. (2011). Teacher Pioneers in the Introduction of Computing Technology in the Swedish Upper Secondary School. In: *History of Nordic Computing 3* (pp. 159–167), ed. by J. Impagliazzo, P. Lundin & B. Wangler. Berlin: Springer.
- Saarikoski, P. (2005). Club Activity in the Early Phases of Microcomputing in Finland. In: *History of Nordic Computing 1* (pp. 277–287), ed. by J. Bubenko, J. Impagliazzo & A. Sølvsberg. Boston: Springer.
- Saarikoski, P. (2011). Computer Courses in Finnish Schools 1980–1995. In: *History of Nordic Computing 3* (pp. 150–158), ed. by J. Impagliazzo, P. Lundin & B. Wangler. Berlin: Springer.
- Staupe, A. (2015). The introduction of computers to primary and secondary schools. In: *History of Nordic Computing 4* (pp. 22–33), ed. by C. Gram, P. Rasmussen & S. D. Østergaard. Berlin: Springer.
- Švelch, J. (2018). *Gaming the Iron Curtain: How Teenagers and Amateurs in Communist Czechoslovakia Claimed the Medium of Computer Games*. MIT Press.
- Tatnall, A. (2015). "Computer Education and Societal Change: History of Early Courses in Computing in Universities and Schools in Victoria". *Information Technology & People* 28(4), 742–757.
- Thierry, B. (2012). "Révolution 0.1". Utilisateurs et communauté d'utilisateurs au premier âge de l'informatique personnelle et des réseaux grand public (1978–1990). *Le Temps des Médias*, 18(1): 54–64.
- Thießen, M. (2019). "NRW 2.0. Zur Digitalgeschichte eines Landes von 1960 bis heute". *Geschichte im Westen* 34/2019, 65–94.

⚡ Workshop Program

Each presentation is 20', followed by a plenary discussion (40')

16th September 2021	
13:00-13:15	Welcome address
13:15-14:15	Essential misfits of computerization? West German Hackers and their newsletters in the Dawn of Private Computer usage Julia Erdogan
14:20-15:20	"Passport to the Future"? The 1980s home computer boom and the creation of a computer literate Britain Tom Lean
15:20-15:30	☕ Coffee break ☕
15:30-16:30	"A Castle on a Hill": The First U.S. Microcomputer Public Access Center Kera Allen
16:35-17:35	Hacker Women, Know-How, and Free/Libre Open Source Software: Weaving the Hackfeminist Dream Irene Soria Guzmán
17:40-18:40	Self-education about microcomputers through entry-level programming books Patrik Wasiak

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17th September 2021	
13:00-14:00	Hardware Hacking in 1980s Microcomputer Culture Melanie Swalwell
14:05-15:05	Our amateurs can work miracles: Computer clubs in 1980s Czechoslovakia Jaroslav Švelch
15:05-15:15	☕ Coffee break ☕
15:15-16:15	From "Computing in the Home" to "Home Computing": The Construction of Computational Living in the 1980s US Software Market Laine Nooney
16:20-17:20	Playing, Coding, Copying: Schools as Spaces of Unruly Computing Knowledge in the 1980s Gleb Albert
17:25-18:25	Concluding discussion

📖 Abstracts

📌 Essential misfits of computerization? West German Hackers and their newsletters in the Dawn of Private Computer usage

Julia Erdogan

In an interview in the German magazine *Der Spiegel* in 1984 the US-American hacker figurehead and editor of the newsletter *TAP Cheshire Catalyst* explained: “We only describe what the kids should not do” (“Wir beschreiben nur, was die Kids nicht tun sollen”). The *TAP* as well as other hacker newsletters were countercultural publications and hackers’ practices were to some extent subversive. By proclaiming learning by detailed description of possible but partly illegal computer usage – which of course called for imitation despite such statement – hacker cultures were able to spread information on ICT that official and professional actors could not apply, as they were state employees or “serious” experts. In addition, newsletters offered the opportunity to disseminate information more widely than classroom sessions; anyone who was interested could order the newsletters independent of time and space, plus they were easy to copy.

In my contribution for the workshop, I want to highlight what kind of knowledge about computer technology hacker newsletters distributed and with which purpose. By also including the reaction of professional experts to these newsletters, I would like to discuss the role of countercultural newsletters in regard to computer knowledge circulation and ask about a particular misfit role of hackers in the dawn of private computer usage. I will focus on two West German hacker newsletters of the 1980s: *Die Datenschleuder*, published by the famous Chaos Computer Club, and *Die Bayerische Hackerpost*, published by a Munich based group of mainly Bulletin Board System enthusiast. Such hacker groups not only educated people in possible applications of computer technology. In the newsletters, hackers articulated the risks and chances of a computerized society. Meanwhile they saw this new technology as the initiator of an open and participatory society - if users empowered themselves by exploring computers independently of prescribed applications and institutionalized thinking.

📌 “Passport to the Future”? The 1980s home computer boom and the creation of a computer literate Britain

Tom Lean

In the early 1980s Britain boasted the highest level of home computer ownership in the world as the country experienced a boom in popular computing. As many as 1.8 million home computers were sold in 1983 alone, most produced by British computer companies, and many of them bought by people who had never even used a computer before. Today the period is looked back on with fond nostalgia, an era of bedroom programming, quirky computer hardware, and fanciful ideas for how computers would change the world, but the home computer boom was driven initially by more serious intentions – the creation of a computer literate Britain. In this paper, I explore the British popular computing boom as an educational event, in which a nexus of actors, in a context of economic and political strife, came together to create a national drive for ‘computer literacy.’

Introducing the wider context, I show how the British state, especially the Thatcher Government, became a prominent supporter of computer education, driven by domestic political concerns and pressing worries about a looming industrial revolution powered by information technology. I discuss the role of the BBC 'Computer Literacy Project' an ambitious public service broadcasting scheme to educate the nation about computing, which even featured its own specially designed 'educational' computer. By interrogating the design and marketing of this and other British home computers, I reveal how the very purpose of these machines was constructed as primarily educational at first, a "Passport to the Future" that would prepare people for the coming IT revolution. From this wider context, I explore the user experience of early home computing, and the importance of magazines and computer clubs in furthering individuals' computer education, arguing that the computer boom was a profoundly educational moment of self discovery for many British citizens, who taught themselves what computers were and what they could, and could not, do.

🏰 "A Castle on a Hill": The First U.S. Microcomputer Public Access Center

Kera Allen

In the late 1970s, David and Annie Fox had an idea for an immersive technological experience. They envisioned a techno-fantasy playland similar to Disneyland, but where the guests could interact with the environment in a way that would result in some new and unique learning experiences. While this type of computerized playground was far from a reality, the Foxes did the next best thing and created a microcomputer center. The Marin Computer Center was the first of its kind – open to the public, it was designed for people to learn how to interact with and use the burgeoning personal computer. The Foxes focused on the aesthetics of their center as much as the technology to give the center a feeling of a comfortable living room. As computers became personal, the Foxes wanted to demystify any misgivings people had, believing that computers would soon be in every household.

The story of the Marin Computer Center (MCC) helps to illustrate a period of diffusion and adoption of the early personal computer before it became a household item. There were fears and misgivings surrounding the use of computers and the MCC ushered computers to those it could reach. The first personal computers did not come easy to use out of the box and required some programming knowledge which the Foxes taught at the Center. However, the MCC's purpose was greater than simply providing access and teaching people to use computers. Its goal was for people to use computers for change – to better themselves and others.

This paper will discuss the ways that the MCC helped educate users and disseminate computer technology. It will also explore how the vision of computers for change invoked by the center manifests the microcomputer as a charismatic technology relying on mythologies and ideological frameworks. This mythological thinking has its roots in the Homebrew Computer Club, where David Fox first saw the microcomputer. The goal for many of those in the Homebrew Computer Club was to make personal computers accessible and that computers should change life for the better. By exploring the workings of the MCC, this paper not only tells how people learned about computers and programming outside of the school system when the microcomputer was new in the late 1970s and early 1980s, but also how user cultures upheld myths about the promise and potential of the personal computer.

🏠 Hacker Women, Know-How, and Free/Libre Open Source Software: Weaving the Hackfeminist Dream

Irene Soria Guzmán

My participation derives from the research project I am carrying out as part of my Feminist Studies PhD at UAM Xochimilco, Mexico City, first programme of its kind in the country. Through its development, I explore practices and experiences of those who I call “hacker women”, and I reflect on processes of appropriation of specialized computational knowledge, on the basis of a feminist methodology that comprises situated knowledge. Likewise, I make use of feminist ethnography and autoethnography to look through my own experience as a Latin American, non-white, activist woman of the free software and free culture movement in Mexico, and how I have deepened my technological knowledge and how I acquired a voice despite my condition of subalternity within hegemonic technological environments, thanks to the path of teaching, where I am forced to explain complex computing concepts to Humanities students.

Analysis of interviews to hacker-women and of my own experience, which I call “my becoming hacker”, is based on questions that focus on 1) the problematization of women’s mastery of technology and the implications of “being a woman” inside masculinized environments; 2) obstacles for an in-depth knowledge of computer technology related to closed-source programming code and its social implications; 3) learning processes that enable technological appropriation and 4) the problematization of the “hacker” concept in a global south context. Even though this is a work-in-process, my pursue is to weave a methodology of technological appropriation that contributes to the 21st century Latin American feminist movement, based on the principles of hacker culture and free software, and towards the spinning of a new and possible hackfeminist struggle.

🏠 Self-education about microcomputers through entry-level programming books

Patryk Wasiak

My paper aims to investigate the repertoire of the entry-level books on the programming of the 8-bit microcomputers as the knowledge used for self-teaching how to effectively use computers in everyday life and professional careers. I argue that the publishers and authors of the books from this genre played an important role as cultural intermediaries that facilitated access to easy to comprehend knowledge about computers in the 1980s. The titles of such books indicate that they were intended for new computer users with no previous experience with computing, for instance: *Computers for Kids*, *Programs for the Home*, *Discover Your Computer*, *Me and My Micro*, *Practical Things to do with a Microcomputer*, *Ready-to-use Computer Literacy Activities Kit*.

Such books were written in an accessible format that resembles the “X for Dummies” book series. Their authors used the strategy of delivering knowledge by presenting themselves as the ‘warm experts’ (*Bakardjieva* 2005) with the extensive use of humorous language and cartoonish illustrations. The repertoire of such books can be divided into three main themes:

- 1) Introductory course in computer literacy with the explanation of computer architecture, functionality, and entry-level computer use skills, for instance, explanation of basic concepts such as ROM and RAM, running programs, file management.
- 2) Introduction to the concept of ‘algorithmic thinking’ as a cognitive skill necessary for designing programs. Such an introduction usually had a format of a course on translating basic everyday life tasks into flowcharts that can be further used as the basic structure of a computer program.
- 3) Example programs in BASIC with extensive annotations. Such programs were used to teach particular aspects of programming and in most cases were dedicated to solving some practical problems at home, or enhance family life through shared entertainment.

In my paper, I outline these three themes and further discuss how such repertoire was used in the process of self-education of computer users. I particularly focus on the role of such books in providing knowledge to social groups other than technically savvy adolescent boys, the most prevailing group of imaginary microcomputer users in the 1980s. For this reason, I specifically address how such books offered knowledge addressed for children of both sexes, adolescent girls, women, middle-aged people, and the elderly.

📖 Hardware Hacking in 1980s Microcomputer Culture

Melanie Swalwell

This talk is drawn from my latest book, *Homebrew Gaming and the Beginnings of Vernacular Digitality* (MIT Press, August 2021) which takes inspiration from Michel de Certeau’s insight that users are makers, coupling this with archival research and oral histories conducted with 1980s homebrew game creators from Australia and New Zealand. Part of the emerging field of game histories, the study presents a history not of ‘great men’ in computing, but of schoolboys and girls and interested adults, typically with local aspirations, learning, experimenting, and sometimes breaking through.

I approach the question of microcomputer users’ making, historically. 1980s users typically learnt some simple programming whilst playing games, but user invention and experimentation were not confined to software creation. Computer hardware also provided many opportunities for “fiddling around” (Heemskerk, 2004)). Indeed, a number of early hobbyist microcomputers came in kit form, requiring that users first assemble them. Hardware hacking and user modifications of micros featured prominently in magazines and books of the era, evidencing a strong electronics and engineering ethos in early computer culture, what I have termed a ‘will to mod’. Yet, the 1980s user’s involvement with electronics is often elided, all but forgotten. Even amongst computing historians, mentions of early users’ electronics nous and hardware hacking are scarce. That this does not receive more attention is surprising, given that electronics was central to many people’s engagement with computers and games at the time.

☞ **Our amateurs can work miracles: Computer clubs in 1980s Czechoslovakia**

Jaroslav Švelch

In Communist-era Czechoslovakia, there was no microcomputer hardware or software market and almost no magazines or books about microcomputer programming. Instead of relying on commercial services, computer fans therefore gathered in amateur computer clubs. It was impossible for people to work and own equipment collectively without official backing, and amateurs therefore had to take advantage of existing state-sanctioned youth or paramilitary organizations. With formal backing and funding from the state, clubs brought together amateurs of different ages, both hobbyists and gamers. Clubs were sites of collective, participatory activities – building hardware, creating and distributing software, and publishing and disseminating information. They channeled the hobbyists' enthusiasm and energy and performed some of the functions that hardware and software markets and the hobby computing press were fulfilling in Western countries.

In my talk, I will follow microhistories of Czechoslovak microcomputer club members and organizers and examine their practices and tactics. I will start in education, looking at young people and their activist instructors, who brought cybernetics and computing into youth groups. The bulk of the chapter will focus on the apolitical *vnye* spaces (see Yurchak 2006) of computer clubs affiliated to various socialist organizations, presenting their hardware, software and organizational achievements and explaining how they maintained their political autonomy. I will also address the heavily gendered, masculine character of the clubs and hobby computing in general. Towards the end, I will compare clubs to the less impactful, but more radical efforts of individual do-it-yourself samizdat publishers, and the use of 8-bit computers by Czechoslovak dissidents, who positioned themselves outside of the club environment, but employed many of the same bricoleur tactics.

☞ **From “Computing in the Home” to “Home Computing”: The Construction of Computational Living in the 1980s US Software Market**

Laine Nooney

Over the first several years of the 1980s, it becomes possible to more closely track two intertwined transformations. First is an industrial transformation, as the expansion of the home software became large enough that identifiable trends in produce sub-categories could be summarized, and home software can be put into context alongside other developing verticals. The second transformation was sociocultural, as the influx of microcomputers into homes raised questions about the role of the computer in domestic space more broadly. Marketers, journalists, and industry entrepreneurs were deeply invested in acclimating new users to the benefits of home computing, spurring both new industries focused on computing accessories and instructional materials, as well as popular writing on how the computer could be of use to the family as a whole. This is home computing not just as software, but as cultural formation, as stakeholders struggled to balance the allegedly revolutionary capacities of the computer in tandem with its potential to be an obtrusive partner in domestic life.

Playing, Coding, Copying: Schools as Spaces of Unruly Computing Knowledge in the 1980s

Gleb Albert

The 1980s' drive for computer literacy in schools all over the industrialized world, in both West and East, has already been studied at length. This paper, based on contemporary sources, memoirs, and oral history interviews, will shed light on a related, yet different phenomenon: Schools as breeding grounds for unruly practices of computing. It shows that while schools were often crucial for facilitating pupils' first encounters with computer technology, their further engagement with computers led them in directions that were not envisioned and condoned by their computer science teachers: schoolchildren all over Europe and the US engaged in copying, playing and programming games and other digital artifacts deemed "useless" by the grown-up world. Moreover, school yards became the breeding grounds for the first true mass home computer subculture, the "crackers", i.e. teenagers competing with each other in breaking commercial software's copy protection. The paper will present and analyze contemporary manifestations of this development as well as reactions from the "grown-up" protagonists of computer literacy, and put them in context of the debates on and practices of home computing in the 1980s.