Article

The Role of Microcomputer Clubs in the Education of the Polish Youth in the 1980s: A Retrospective Analysis

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Abstract: In the 1980s, Polish schools hardly had access to computers, particularly at the primary and secondary levels. The main reasons were funds and shortage of qualified staff that could handle computer hardware. As a consequence, the youth first came across a computer, how to use it, service hardware, and write programs outside schools in the early 1980s. Often informal groups of hobbyists gathered around a single computer were the seeds of microcomputer clubs, which cropped up in huge numbers in Poland in the 1980s. The objective of the paper is to portray the role of microcomputer clubs in the process of shaping the youth and computer education in the 1980s in Poland compared to other countries. The conclusions are founded on a literature review. The analyzed material included an Internet Archive collection "The Computer Magazine Archives". The content of one of the first Polish computer magazines, Bajtek Magazine was analyzed in detail. It has been demonstrated that the Polish youth of the 1980s first came across a computer mainly outside schools, primarily in microcomputer clubs. It was the root of computer and information technology education in Poland. Moreover, microcomputer clubs were reported to provide education, as well as foster character education, aid socialization, and shape attitudes.

Keywords: computer education; early childhood upbringing; beginnings of computerization; digital heritage; hardware heritage

1. Introduction

At the verge of the 1980s, computers were used mostly in university laboratories, corporate offices, sometimes at home, and (universal) education institutions. In primary and secondary schools, computers, if any, were used as teaching aids to develop a sense of control over hardware and foster the teaching process. They were intended as a backbone for an environment for modern learning in many domains, such as music, foreign languages, arts, physics, biology, or mathematics. Furthermore, they were the foundation of an unprecedented type of school where the computer was a universal tool to facilitate learning [1].

Public-funded institutions in Poland and the Eastern Bloc used mostly homemade systems, mainly due to hardware and software availability and pricing in the 1980s. Things were slightly different in places that grew as grassroots initiatives run by computer enthusiasts. In the 1980s, Polish schools had little to no access to computers, particularly at the primary and secondary levels. The main reasons were insufficient funds and a lack of qualified teachers that could handle the hardware. Note that it was not only in Poland but in most countries that computers were a rarity in the 1980s. Schools could not afford to buy computers or teach computer and information technology. A home computer was not a common sight, either. Nevertheless, any such system attracted fascinated young people. Often, informal groups of hobbyists gathered around a single computer were the seeds of microcomputer clubs, which cropped up in huge numbers in Poland in the 1980s. As a consequence, the youth first came across a computer, how to use it, service hardware, and write programs outside schools in the early 1980s.

Most research publications on computer education focus on the future: modern technologies and trends in teaching [2], learning, and technology-aided education (today and in the future) [3], socio-educational perspectives of guiding children and youth, and new instructional techniques, models, and tools [4], including remote education [5]. It suggests that analysis of certain historical phenomena that affected the education and formation of the youth is less popular. The general development of computer education has its origins that illustrate its path. It opens a research gap, which encompasses the phenomenon of microcomputer clubs in Poland in the 1980s. The objective of the paper is to portray the role of microcomputer clubs in the process of shaping the youth and computer education in the 1980s in Poland compared to other countries.

The remainder of this paper is structured as follows. Section two depicts the beginnings of computerization and the activity of microcomputer clubs in Poland in the 1980s. It presents a computer magazine, Bajtek, which documented the history of clubs with its BAJTEK Golden Disk Contest (O Złotą Dyskietkę BAJTKA). The third section presents the retrospective research methodology, the sources, and keywords. The results are shown in section four, which focuses on characterizing microcomputer clubs, venues, the scope of activities, organizational structures, and the socioeconomic conditions of the clubs. The fifth section discusses the activities of the clubs, including education and attitude-building and early computer education curricula in selected countries. The summary demonstrates that the clubs were established to integrate computer users, train new personnel, exchange experience, hardware, and software, build relationships and offer entertainment.

2. Background

The notion of a "club" was characteristic of 1980s Poland when various types of neighborhood, afternoon, or workplace clubs were established to integrate local communities. Microcomputer clubs were places for learning about the structure of the computer and how to operate it. The primary mission of the clubs was to promote computer education among young people, gather and disseminate information concerning informatics and its application, and create universally available microcomputer programs—all this required hardware and software. Albeit many such communities did not even have their own systems on day one. Young people and tutors often had to rely on discussions, computer press and literature, and mock-ups of actual systems or their functional simulations (as was the case with the in-school club Szkolne Kółko Komputerowe in the W. Broniewski Second Secondary School in Koszalin). The process of learning programming languages without a computer was referred to as "dry" learning [6]. For this reason, only the most persistent members persevered after some time. Users who wanted to pursue a passion not only have a nice time with a video game.

Many members were rather ambitious. Sponsors and tutors in the clubs wanted to prevent any associations with gaming dens. They strove to direct children's attention towards learning the basics of informatics and electronics, studying programming languages, and putting together computer programs rather than focusing on games [6]. Most clubs' activities focused on education, attitudes, and social development. Note that the clubs were run by enthusiasts skilled at operating computers who were scarce in Poland in the 1980s.

The clubs were set to shape innovative attitudes, cross awareness barriers, and offer broad computer education as part of the technical education of the youth [7]. Members of the clubs focused on learning the structure of hardware and arcana of programming. According to press reports, pupils who attended microcomputer clubs wrote their original programs, mostly educational ones. Only some accounts mentioned computer games that were allocated limited time, primarily spare time. The authors emphasized that all club members were good students (meaning the computer did not invade their learning time). Many were even finalists of official school subject contests [8]. Therefore, the reports focused on the educational merits of computer systems that were to be used for practical applications, not entertainment. Still, many started their computer journey with computer games and did not progress from there. The analysis yielded a research

hypothesis that computer education in Poland started from microcomputer clubs. It was due to the fact that computer education happened mostly outside school because schools did not have sufficient funds or computer systems. Moreover, a hypothesis is proposed that microcomputer clubs provided education, as well as fostered upbringing, aided socialization, and shaped attitudes.

BAJTEK Golden Disk Contest

The Bajtek magazine is an invaluable source of insight into the reality of microcomputer clubs in Poland in the 1980s [9]. It was one of the first high-circulation computer journals in Poland and quickly became popular. It was published from 1985 to 1996 and was highly appreciated by computer aficionados in its peak [10]. It was because many readers of the computer press in Poland did not have a computer and wanted "at least to taste the modernity and global trends" [7]. Today, Bajtek is a symbol of early computerization in Poland in the 1980s.

The idea of the Bajtek computer magazine was conceived in mid-1985 by journalists who later edited the Komputer monthly. It was initiated by Władysław Majewski and Marek Młynarski [11]. The project quickly turned out to be a success. It was the beginning of home computer import, and people were eager for computer knowledge [12]. The same year, state-controlled stores, Pewex offered the first Ataris [13]. Polish users could also obtain ZX81 Sinclair and ZX Spectrum manufactured since 1982 [11]. The trend did not go unnoticed by the Polish United Workers' Party (the ruling communist party in the Polish People's Republic), which wanted to emphasize the educational nature of the magazines and their potential to shape young people [14]. It had a significant impact on the content of virtually any journal in Poland, including Bajtek. Note that the computer press at the time had to tackle technical challenges, such as small rations of paper or even lack of paper, problems at print shops, censorship, and problematic distribution. Moreover, the editorial teams of the magazines did not work together. They established slightly hermetic, rivaling circles [11].

To have a computer at home in the dull reality of the 1980s Polish Peoples' Republic was something magical. Therefore, school pupils aged 7 to 15 and secondary school students were immensely enthusiastic about computer systems. The Internet was unavailable at the time, and the sources of information were the press and TV news, such as Teleexpress (a news magazine broadcast by the Polish Television every day since 1986 till today) or Telewizyjny Kurier Warszawski (the oldest news magazine of the Polish Television broadcast today since 1958).

Bajtek held various contests at the time, such as crosswords or the Christmas competition. Answers were submitted by mail and often came in tens of thousands. Some contests elicited nearly a hundred thousand letters that were verified, and the winners were picked at random [15]. However, the Bajtek Golden Disk Contest, announced in the 1980s caused an unprecedented flood of responses.

The Bajtek Golden Disk Contest presented the backstage details of microcomputer clubs from all over Poland. It was held under the auspices of the Minister, Member of the Council of Ministers for the Youth and supported by the Association of Rural Youth, Polish Scouting and Guiding Association, Tournament of Young Masters of Engineering of the Polish Socialist Youth Union, and the Central Warehouse of the Scouting and Guiding Association. The contest was open to all microcomputer clubs: workplaces, schools, youth organizations, and community centers. In addition, Bajtek accepted submissions from informal clubs as well. The prize, microcomputer Amstrad 6128, was sponsored by the Minister for the Youth [16]. The two editions of the contest attracted several dozen microcomputer clubs from all over Poland (Table A1).

The first edition of the contest took place in 1987, and the winner was the MERIZAP club at the MERIZAP Complex of Technical Schools [17]. The second edition was announced in October 1988 [18]. The organizers noted that microcomputer clubs in Poland had to face numerous issues, such as how to organize meetings (curriculum), what to

teach, should computer games be promoted, and how to secure funding. The contest was intended as a presentation of the achievements and ideas of clubs and dissemination of good teaching, organizational, and economic practices. The following criteria were evaluated [18]: the public footprint of the club, accessibility and openness, tangible effects (such as original software), educational and promotional activity, independent acquisition of hardware and aids, delivery of various levels of training, and innovative forms of activity.

3. Materials and Methods

Research on digital cultural heritage tends to employ retrospective analysis, focusing mainly on archaic hardware and software with the associated socioeconomic and cultural environment [19]. Such analyses are founded on archival materials, including research journals, science magazines, and databases [20].

The foundation of the present work is a literature review that included research papers and 1980s industry literature. Archival materials were obtained from the Internet Archive. The analyzed material included a collection of "The Computer Magazine Archives". The content of one of the first Polish computer magazines, Bajtek Magazine was analyzed in detail. Archival issues were browsed manually or using the Internet Archive's search engine and the following keywords: edukacja (education), konkurs (contest), złota dyskietka (golden floppy disk), kluby (clubs), and kluby komputerowe (computer clubs). The search was facilitated by the organizational structure of the magazine and its division into sections or clans addressed to users of various platforms, such as Atari, Commodore, ZX Spectrum, Amstrad, and IBM [10,21]. The background for the analyses was a presentation of selected socioeconomic phenomena relevant to the availability and sale of computer hardware in the Polish People's Republic and neighboring countries.

Retrospective (ex-post) analyses help track the evolution (history) of a phenomenon and potentially forecast (model) the future with secondary data analysis. A retrospective analysis is a "glimpse into the past" from the perspective of the known effect of an event. It most often involves a search for factors that could lead to the known outcomes, results, and consequences. They can often determine the trend line, maximum/minimum, and outliers and use the data to forecast future behavior or tendencies. Retrospective analyses help understand what we call the present (current state) better by analyzing the "evolutionary path" or the cause-and-effect. They are used for such endeavors as retrospective literature reviews [22,23], analyses of the impact of new technology and computers on education [24,25], education quality research, analyses of deployment of new technologies [26], and analyses of causes and consequences of socioeconomic phenomena [27–29]. Furthermore, retrospective research is used in medicine and environmental quality and condition research [30,31]. It is also successfully employed in pilot research to build hypotheses and plan prospective research.

4. Results

The 1980s saw computer (or microcomputer) clubs crop up all over Poland, both in rural and urban areas, but usually in places where at least one computer was available. The clubs were established at workplaces, municipal community centers, neighborhood clubs, or school community centers (Figure 1). Members of the clubs were mostly boys because, as they put it, "girls are not really interested in computers, at least for now" [8]. The same pattern was noted in other countries [32].

The government of the People's Republic of Poland did not want computer clubs to be associated with social life or entertainment. It was consistent with the idea behind the clubs; their primary function was to educate, give young people a purpose and a way to spend time, and secure a future expert IT workforce. Therefore, representatives of the clubs stressed the youth had access to hardware, knowledge, a tutor, computer magazines, and utility software in the clubs [33]. For the members, the crucial components were a separate space, companions, community belonging, the atmosphere of something special, and a computer, of course, at least one. Still, computer club hardware resources were

mostly modest, to say the least (Table A2). For example, the municipal community center in Raciążek established the Bajtek computer club in April 1986. Initially, it had only one Commodore C-64, two Neptun monitors, a magnetic tape storage device, printer, and disk drive.
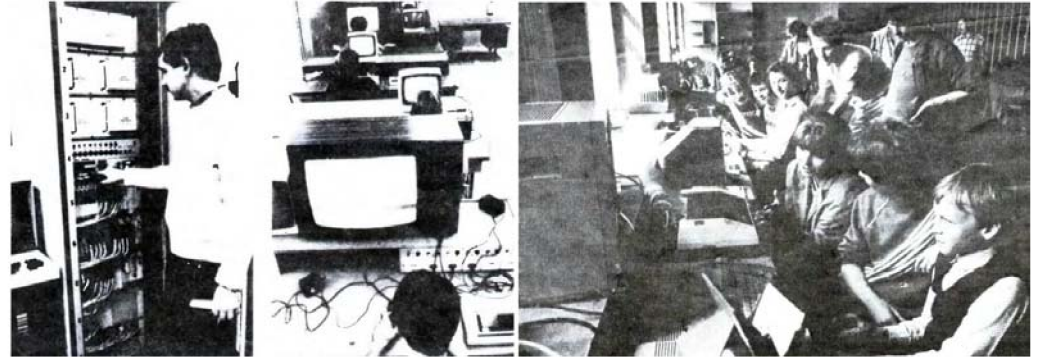

Figure 1. Left to right: the MERIZAP club computer room (Ostrów Wielkopolski, 1987). Source: [16]. The opening ceremony in the Bajtek microcomputer club in Bytom (1987). Source: [33].

The club was attended mostly by senior primary school students and secondary school students. The clubs operated according to specific rules. Tutors delivered the classes on selected days of the week at specific times. Apart from learning, the members had time for fun, but it was to enhance the educational effort. Press accounts emphasized that the members strove to find out how games were written and modify them [33]. Not all clubs had many members. Still, it was not necessarily bad for those who had one or a few computers and modest budgets. For example, the microcomputer club FUTURE in Oleśnica had 12 members in 1989, and half of them had a computer [34].

4.1. Workplace Computer Clubs

Some clubs were established for residents of specific neighborhoods, but others focused on educational institutions, cultural venues, or production facilities. One of the latter was MNEMONIK, a microcomputer club established in an electronics factory Zakłady Elektroniczne ELWRO in Wrocław in 1986. "MNEMONIK" has a meaning in assembler languages, but in Polish, it is another word for a mnemonist, a person with outstanding memory.

Zakłady Elektroniczne ELWRO in Wrocław has significantly contributed to the development of informatics in Poland. The computers constructed and manufactured by ELWRO were used to computerize institutions, businesses, and entire industries in Poland. In 1986, ELWRO manufactured a pilot line of school personal computers, the Elwro 800 Junior for teachers and students [35]. The Elwro 804 Junior was a home-use personal microcomputer for work, learning, and entertainment. It could also aid with data processing in businesses. The computers were first mass-produced in 1987 and were quickly deployed in several thousand schools in Poland. Many students and teachers were trained with this hardware.

The fact that the club was established in ELWRO put it in an excellent position. The members had access to the ELWRO Junior. However, the club had other functions as well. It promoted homemade IT products and educated and trained the next generation of IT technicians. The club also affected the image of ELWRO. MNEMONIK was a founding club of the Polish Foundation for Computer Education where it provided training on the use of computers in teaching children with special needs [34]. Therefore, computer clubs played important public roles both on the local and national levels.

CELBIT computer club was established under the auspices of a cellulose factory Zakłady Celulozowo-Papiernicze in Kwidzyn. It was by no means accidental. To modernize the production line, the management needed computers and trained personnel. The club was meant to give young people access to hardware and education and trained qualified staff.

CELBIT had three Timexes, one Polbrit, and Ataris 800XL (all with peripherals) [9]. In 1987, the club had over 200 members. It was located in a local community hall in Zatorze II, and then in the city community center. It was famous for numerous industrial events. Another workplace computer club was Złoty Amstrad established in 1987 in a plastics and paint factory Zakłady Tworzyw i Farb in Złoty Stok. The club collaborated with primary schools in Złoty Stok and helped the students learn how to use a computer. The club classes were divided into two sections: programming and computer games. The programming section focused on LOGO and Turbo Pascal and program writing in dBase. In 1989, the club had 130 permanent members, part of whom participated by mail only [9].

4.2. Character and Attitude Building

The clubs also shaped the young people. Many of them offered additional educational classes where the participants could watch popular science films, for example, or edited and published educational brochures in addition to computer education [9]. Apart from clubs in workplaces, which focused on educating future personnel, computer clubs were also shaping the youth and building their attitudes. A good example is a scout's club Harcerski Klub Komputerowy HarcBajt from Gańsk.

The education in the clubs was most often organized as non-school classes. It was not uncommon for the classes to take place every day and last several hours [16], as was the case in HarcBajt. One day of the week was a gaming day open to all. In addition to computer education, the club developed general technical skills. The members' activity involved speculative fiction as well [9].

Sometimes, club members helped teachers break the computer ice—it was not easy to find computer-qualified educators in the 1980s. Often students brought their computers to classes and prepared lesson plans to give others access to new systems. Clubs held training courses for teachers as well. A good example is the 105-h training course for primary school teachers that included BASIC and the Spectrum. Its other part focused on PASCAL and LOGO [16].

4.3. Informal Clubs

Microcomputer clubs strove to stand out among others. Most of them were formalized and had curricula to guide the learning process, but some were much more individualized. One of such less formal organizations was Mr. ATARI from Kozienice. According to its members, they operated without strict requirements, clear objectives, or a policy. It was partially because its members would meet in small groups at homes and then exchange experiences. The founders of the club had no patron or sponsor and were adamant opponents of principles and guidelines. The members considered their contact with the computer as a fun time [16].

Members of some clubs, like BOBAS-ATARI from Gliwice, said they were not actually a club but a group of friends with shared interests. They declared the club was open to anyone who could conform to a single prerequisite: be likable. They did not pretend games were not their primary focus. They had no fixed days or venues for their meetings, paid no membership fees, and had no membership cards. They met at home when they felt like it. The club members emphasized that computers brought them together [8].

Computer clubs could also be family organizations. BIT from Warsaw was a unique family computer club of four members of the Ziembińscy family. The club, if the term could be stretched to cover a family of four, had a slightly different attitude towards computers as they were more a source of entertainment. According to the "club members" the computer time was considered entertainment. The family treated their computer activity as a club operation because they often had visits from other computer aficionados [16].

4.4. More Than Just Local

Larger, more formalized clubs, usually in workplaces, were engaged in broader activities outside of local training meetings. For example, MIKROS from Warsaw obtained

hardware and software from various Polish companies and collaborated with the Polish Television in its DIY show "Majsterklepka". Via TV, the club members built a mail computer club. Many clubs forged international contacts, primarily by mail [36].

Clubs that had sponsors, tutors, or patrons could count on their aid to tackle financial and organizational obstacles. It was not uncommon in smaller localities that club tutors were the only people around or in the town with the knowledge and skills necessary to use a computer and deliver programming courses. On the other hand, so many young people found computers fascinating that only the chosen few could attend classes in clubs with one or few machines. Here, an example is the FENIKS computer club in Recz where only one-fourth of those interested could be admitted, and there was only one teacher in the town who could use a computer, the founder and tutor in the club [37].

The club activity was supplemented by associations. Stowarzyszenie Mikrokomputerowe ABAKUS was established in 1984 to continue the effort of the first Polish microcomputer club started a year before. It was necessary to guide the development of computer clubs in Warsaw better. In 1984, ABAKUS operated five computer clubs with two community centers offering several dozen microcomputers, including the Atari 800 XL, Commodore C64, ZX Spectrum, Amstrad 464, and Schneider PC 1512 [33]. The association focused on the promotion of computerization, building of computer culture, and education. According to the association, the public in Poland was craving for computer education and promotion, such as computer events, contests, lectures, and seminars in the mid-1980s. Its members intended to write and share their software as well.

5. Discussion

The process of equipping schools with computers was slow in Eastern Europe, including Poland, in the 1980s. Research shows that most educational institutions did not have a single computer. "Computer lessons" were often optional and employed pen and paper without access to actual hardware. The main reason was insufficient funds to acquire computers, geopolitics, and the shortage of staff who could operate and maintain computers. Still, young people were very curious, to begin with, and grew even more interested as they came across rare computers brought from abroad or bought for foreign currency. The labor market was also eager for new experts. These circumstances created the space for out-of-school computer education, quickly filled in by microcomputer clubs. They took over the education (and partially upbringing) of young people in the 1980s in many countries to some extent.

5.1. Great Expectations, Even Greater Aspirations

The state of the computer industry in the early 1980s in Poland was relatively good among Eastern Bloc countries, but mere ten years later, it was dubbed a "hardware museum in the middle of Europe". Other countries, such as Bulgaria, mass-produced computers (the PRAWEC and VAC) and were ahead of Poland in terms of technology. The average Pole living in the late 1980s associated microelectronics mostly with TV advertisements of computers and various "stumbles" of the central and local governments that were always the fault of new computer systems. According to Bolesław Szafrański, computer technology was frozen at the artisan level in 1989 Poland. Many gifted researchers and technicians were mainly putting together systems from parts imported from Taiwan, Singapore, or South Korea [38]. Authors pointed out that Poland did not produce parts at home, such as reliable microprocessors. Computer prices were high, and no systemic changes were made to streamline processes with computers. What made the matter worse, electronics were expensive and perceived as luxury goods, which hindered its public perception [38]. This resulted in great expectations from and ambitious plans of computer clubs.

5.2. Microcomputer Clubs as the Breeding Ground for the Intelligentsia

It was not an easy task to establish a professional microcomputer club in the 1980s. Roland Wacławek listed several obstacles, mostly organizational and financial ones, such

as securing a venue, hardware and software, teaching aids, and engagement of the required personnel, teachers, and instructors. Still, even staff and hardware were not a guarantee of success [39]. According to Wacławek, it was necessary to build an "authentic environment", the right atmosphere and culture for hardware and software contact, and a mind-frame change (Figure 2).

Figure 2. Basic computer science laboratory, electronics and modelling department of the Palace of Youth in Warsaw (the ZX Spectrum, 1983). Source: [7].

In the early days, microcomputer clubs in Poland were set to gain the attention of potential members, which required publicity. There was nothing wrong with it. On the contrary, it promoted computer science, establishing new relations, and finding sponsors, all of which were necessary. Still, it could negatively impact the most talented members whom Wacławek believed to be introverted and potentially perceived as asocial persons in the 1980s. "Computer geeks" did not appreciate crowds or hustle. Still, social life thrived in many microcomputer clubs in Poland. The clubs were places where friendships were born. They were considered venues where people could meet and play computer games or just use a computer. However, Wacławek believed that norms of behavior, manners, and intellectual culture should be adhered to in the clubs. The clubs should be used to expand horizons and interests, not provide entertainment and company. A computer club should be a breeding ground for the intelligentsia proper, people who can offer something more than just education with a diploma to vouch for them. The clubs should educate active people with the right mindset and attitudes towards problems of science and technology. They should help computer enthusiasts, shape the proper intellectual backbone, and integrate those dealing with computers. Moreover, members should have computers at home and school and come to the club only to self-improve and meet professionals. The club should have access to international literature, technical files, and a diversity of systems. All this was hard to achieve. In the 1980s, even the simplest, and elsewhere cheap, computers were luxury goods in Poland. In addition, many computers in Polish clubs were good mainly for basic computer courses and entertainment. As a consequence, people with substantial computer knowledge who had computers at home and work did not frequent the clubs. Besides, many computer experts did not want to promote expert knowledge for fear of losing their "advantage and position" gained with their experience [39].

5.3. Microcomputer Clubs in the World

Microcomputer clubs were found all over the world. Members of Złoty Amstrad from Złoty Stok had lively correspondence with clubs from nearby countries, the Soviet Union, Czechoslovakia, Hungary, and Bulgaria. It was because the club focused on Amstrad computers, which were rather popular there. Złoty Amstrad was the first Polish microcomputer club with international partners [9].

Microcomputer clubs were found in many countries that are now EU member states and in the East (Russia, for example). One of such clubs was located in Bremen, former Federal Republic of Germany (Bundesrepublik Deutschland in German, West Germany, 1949–1990). Pfadfinder Computer Club was operating under the auspices of the UNH power company. It was established following the example of a Polish club HarcBajt visited by the founders of Pfadfinder Computer Club in 1987. They were surprised by the popularity of microcomputer clubs in Poland and wanted to start a similar organization in their city.

In 1987, Pfadfinder Computer Club found a sponsor, SIEMENS, which funded PC SIEMENS computers with software. The official opening ceremony took place in the UNH factory on 2 February 1988. Forty-eight out of 237 candidates were selected due to hardware, venue, and personnel limitations. The clubs provided education and attitude-building activities in groups of eight. The basic training was in general computer and peripherals use. Hamburg and Berlin also had computer clubs in the 1980s. They were crucial because computer (informatics) education started relatively late in the Federal Republic of Germany [40].

Many microcomputer clubs in Moscow (the Soviet Union) followed similar principles to those in Poland. Rooms and hardware were similar, except keyboards, perhaps, that had different labels [32]. AGAT (Moscow) stood out as a payable service. To enter the club, guests had to buy a ticket. One hour in a room with the simplest Soviet homemade computers, the Mikroshas was 50 copecks. An hour in a room with slightly more advanced AGAT computers was 1.2 rouble. The club admission for non-members was payable for all who wanted to use the computers, but the fee covered an instructor and a library of programs as well. This solution, to some degree, resolved the issue of excessive numbers of people who might want to use the computers and provided funds for tutor remuneration and other overheads.

The AGAT was assembled in the Lianozovo Electromechanical Plant. The annual output was about three thousand units. Club AGAT was established in 1986 and had two computer rooms and a technology laboratory from day one, thanks to its patron. The club also housed the first computer rental in Moscow. It cost 80 copecks to rent the Mikrosha for a day. The AGAT was 6.5 rouble a day. The difference was due to the value of the computers. The Mikrosha cost approximately 500 roubles in the 1980s, but the AGAT was much more expensive at 4900 roubles. The club had a dynamic programmer section and focused more on science, technology, and commercial activities. Employees of the plant were very active users, and the club made a profit and became famous, which helped the image of the plant [32].

5.4. Who Were the Users of Microcomputer Clubs?

According to the Higher Komsomol School, most of the attendees in Soviet computer clubs were 30 or less (91.3%). The largest groups of young people came from primary schools (66.1%), technical secondary schools (10.5%), and higher education institutions (6.8%). Most of the clubs had several to several dozen members. Thirty-six percent of clubs in the Soviet Union had over 100 members in 1989; 20% of the respondents belonged to clubs with 30 to 50 members. Small clubs with up to ten members amounted to 24%. Merely 14.6% of the members had a computer at home, most often the Soviet BK-0010 and Japanese Yamahas and the Mikrosha and DWK. Access to computers was limited. This did not stop the authorities from deploying a new subject in Soviet schools, which was rather innovative for the time: introduction to computer science and computation techniques [32].

The results of the Higher Komsomol School were consistent with sociological research on computer clubs in Poland. The club lifespan usually did not exceed three years. Moreover, all respondents stressed the need for more computer units [32].

All farmer associations in Czechoslovakia (a Central-European state dissolved in 1992) had microcomputers in the mid-1980s. Computers could also be found in schools, universities, and youth clubs [41]. One of such clubs (T-Klub) existed in Bratislava in 1987 under the auspices of the Czechoslovak Socialist Youth Union. It welcomed all interested in microelectronics. All club members could access computers freely (the Czechoslovak PMD). In addition to video sessions and gaming tournaments, the club had more ambitious goals. It held software fairs, screenings of training videos, and basic programming courses for clubs and informal groups from the entire country. It also offered distance learning and published information brochures. The club was open every day, and its resources were available to students at the Slovak Higher School of Technology and secondary schools. The primary attendees were school students [41].

Education and consulting were the most time-consuming activities in the club, but its leaders had higher aspirations. Education and upbringing were to be complemented with research and production. The plan was to start an experimental, small-scale production of unique computer prototypes in 1987–1988. Plans of the prototypes were complete thanks to the "Electronics every day" contest held by T-Klub in the school year 1986/87. The contest was addressed to young designers. The devices had to be cheap to manufacture. The component costs were limited to two thousand and one thousand korunas depending on the category. The first prize was four thousand korunas, while the average salary in Czechoslovakia in 1987 was three thousand korunas [41].

When some countries were at the beginning of computer education in schools, others were gaining momentum in this regard. In the late 1980s, 94.9% of schools in the USA used computers for educational purposes to various degrees. Several years earlier, only 16.5% of them had computers. The trend was clear. The computer was becoming the centerpiece of the teaching process, and new technologies were to become as commonplace as a pencil or notebook. School computerization in the USA was far from uniform, but relatively cheap personal computers helped accelerate the process [32].

5.5. Early Computer Education in Curricula—The USA

In the 1980s, computers were a new thing not only in Poland but the entire world. Manufacturers of computer systems were aware of the need for user education, coupled with the promotion of computers and their applications. Education bridged the gap between the user and the computer, still a novelty in the 1980s. It also promoted and propagated new technologies for everyday use. Higher education institutions, students, teachers, and administration personnel were a significant market. It paid off to invest in school education programs that made use of computers. Therefore, the 1980s saw various (education, technology, socioeconomic, and deployment) projects to educate about computers and with computers. The projects were implemented in schools where pupils had access to computers from early on. Because costs of hardware, research, and curricula usually exceeded the capabilities of the (public) education system by a large margin, computer industry stakeholders were invited, such as MIT Logo Group or Texas Instruments. The goal of the projects was to create conditions where access to computers would not limit learning and find out what students could learn under such circumstances. The first findings in such projects were the ease with which the youngest users of four to nine years used basic computer functionalities (Figure 3) [1].

Figure 3. Preschoolers using LOGO TI at Lamplighter School in Dallas, Texas. Photograph courtesy of Texas Instruments Inc. Source: [1].

A good example is the collaboration of Tandy Corporation/Radio Shack and teachers to introduce computers to the curriculum, including educational software and hardware (Figure 4). What Tandy Corporation/Radio Shack did by sponsoring teacher training courses, a nationwide grants program, and educational conferences was a textbook example of corporate social responsibility. The Education Division at Radio Shack designed a courseware library with curriculum experts to provide high-quality training materials for students. Moreover, Radio Shack held free training seminars for teachers at Radio Shack Computer Centers that covered BASIC or Pascal programming, among other things [42].

Figure 4. Radio Shack's commitment to education. Source: [42].

In 1984, Tandy Corporation/Radio Shack joined the continuing education program at the University of Texas, Austin to sponsor a conference on computer use in education. It was presented as a place to discuss applications, benefits, and developments in educational computer use. The other conference in spring 1985 was another opportunity for educators to stay up to date with educational computer technology [42].

6. Conclusions

Every microcomputer club holds stories from the socioeconomic development of Poland. They were places where the youth culture was shaped as a distraction from the dull reality of the Polish People's Republic. Their characteristics varied significantly. Some had rich sponsors or support from organizations, often technical. Others were driven by social or even family life. Chosen few had valuable computer systems, others had to make do with a single private machine, others still had no hardware at all.

Microcomputer clubs provided education as well as fostered character building, aided socialization, and shaped attitudes. They united young people attracted by a strong magnetism of common interests. They played the roles of community centers and youth centers and gave their members a sense of belonging to the growing family of computer aficionados. Many couples met in front of computers, working together in a microcomputer club [6]. This way, computers literally brought people together.

The primary goal of microcomputer clubs in the 1980s was to teach and integrate computer users, allow them to learn, exchange experience, hardware, and software, but also present how a computer could be used for work at home and at school. Most of them did not have fancy machines or spacious premises but still managed to attract large numbers of people passionate about computers. They were often the only places nearby where technology enthusiasts could meet and have access to software, hardware, and accessories that were rare in the 1980s. The space to exchange experience, present (programming) results, and forge new contacts was invaluable. As the availability of computers grew and the Internet stepped in, they were replaced by Internet cafés. Today's more or less formal groups of highly-specialized hobbyists, gamers, or aficionados look nothing like club computers of the early days of computerization.

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Appendix A

Table A1. List of clubs participating in the Bajtek Golden Disk Contest (1987).

Club Name	Place	Established	Location (Sponsor, Patron)
Amstrad-Schneider Club	Bełchatów	ND	Mining and Power School Complex in Bełchatów
ATARI	Choszczno	1986	Community centre in Choszczno
ATARI	Olsztyn	1986	Dairy cooperative JAROTY
ATARI	Wręczyca Wielka	ND	Forest Board in Wręczyca
ATARI TEST	Piotrków Trybunalski	ND	Voivodeship community centre in Piotrków Trybunalski
BAJT	Łazy	1986	Scout Troop Command in Łazy
BAJTEK	Kraków	1986	Board of the Polish Socialist Youth Union for Kraków-Śródmieście
BAJTEK	Zamość	1986	J. Zamoyski First Secondary School in Zamość
BIT	Warsaw	1986	No patron
BOBAS-ATARI	Gliwice	ND	Informal club, no venue
C.C. ATARI	Choszczno	ND	Community centre in Choszczno
CELBIT	Kwidzyn	1986	Paper factory Zakłady Papiernicze w Kwidzynie
CHOMIK	Warsaw	1986	CHOMICZÓWKA Resident Club
COMMODORO-BAJT-CLUB	Bydgoszcz	1987	No patron
DK MASTERS	Rawicz	ND	Community centre in Rawicz
FENIKS	Recz	1986	Town and municipality community centre in Recz
Future	Oleśnica	ND	Informal club, no venue
Harcerski Klub Komputerowy HarcBajt	Gdańsk	1987	Scout Regiment Command in Gdańsk, Scouts' House in Gdańsk
Harcerskie Centrum Komputerowe	Lublin	ND	Scout Regiment Command in Lublin
INFORMIK	Bydgoszcz	1986	No patron
INFORMIK	Olkusz	1986	Primary School No. 1 in Olkusz
Klub komputerowy	Mielec	ND	Community centre WSK "PZL-Mielec"
Klub Komputerowy MMT ALFA	Stargard Szczeciński	ND	Housing cooperative in Stargard Szczeciński

Table A1. *Cont.*

Club Name	Place	Established	Location Sponsor, Patron)
Klub Komputerowy MMT BIN	Turek	ND	Polish Socialist Youth Union in the Adamów Brown Coal Mine in Turek
Klub Komputerowy przy Pałacu Młodzieży w Szczecinie	Szczecin	1986	Palace of Youth in Szczecin
LOK	Nowy Sącz	1986	Voivodeship Board of the National Defence League
MAD BOYS ATARI	Żyrardów	ND	Informal club, no venue
MANIAK	Warsaw	1985	Neighbourhood club in Ursynów
MERIZAP	Ostrów Wielkopolski	1985	MERIZAP Complex of Technical Schools in Ostrów
METRO-POST	Piotrków Trybunalski	1986	Primary school No. 3
Młodzieżowy Klub Komputerowy MIKROBAJT	Łódź	ND	Inter-company club of printing industry employees "Chochlik"
MNEMONIK	Wrocław	1986	Electronics factory Zakłady Elektroniczne ELWRO
Mr ATARI	Kozienice	1985	No patron
POLTRONIC	Częstochowa	1987	No patron
SAVE	Słupca	1985	M Jackowski Economics Schools Complex in Słupca
SINCLAIR CLUB	Kraków	1985	No patron
SPECTRUM	Lublin	ND	Mechanical and Power Engineering School Complex
SYNTAX ERROR	Koszalin	1986	Association of Rural Youth
TIME-Studio	Łęczna	ND	Secondary School Complex in Łęczna
TOMBIT	Stegna Gdańska	1986	No patron
WITEŹ	Kielce	1986	Microcomputer inspectorate of Scout Regiment Command
ZŁOTY AMSTRAD	Złoty Stok	1987	Zakład Tworzyw i Farb Złoty Stok, plant community centre

Source: own work based on Bajtek [6,9].

Table A2. Resources available in selected computer clubs in Poland in the 1980s.

Place	Name of the Club or Association	Members/ Established	Computers Available	Location (Tutor, Sponsor, Patron)	Reference
Raciążek	Bajtuś	25/1986	Commodore C64 (2 units)	Municipality community centre	[33]
Warsaw	ABAKUS	ND/1984	Atari 800 XL, Commodore C64, ZX Spectrum, Amstrad 464, Schneider PC 1512, and others	ABAKUS microcomputer association	[33]
Wrocław	MNEMONIK	ND/1986	Polish computer Junior	Electronics factory Zakłady Elektroniczne ELWRO	[34]
Oleśnica	FUTURE	12/ND	Commodore C64	Room in a neighbourhood club	[34]
Przemyśl	Centrum Komputerowe Młodzieżowego Ruchu Kultury w Przemyślu	ND/1987	Spectrum Plus (5 units), Atari 800 XL (9 units), Atari 130 XE (1 unit)	Youth community centre in Przemyśl	[15]
Koszalin	Szkolne Kółko Komputerowe	ND/1986	No hardware Work based on computer publications	W. Broniewski Second Secondary School in Koszalin	[15]
Kwidzyn	CELBIT	200/1986	Timex (3 units), Polbrit (3 units), Atari 800XL (3 units), Commodore C64 (1 unit), IBM XT (unit)	Cellulose factory Zakłady Celulozowo-Papiernicze w Kwidzynie; local community hall in Zatorze II, city community centre	[9]
Złoty Stok	ZŁOTY AMSTRAD	130/1987	Amstrads, including the Amstrad PC 1512	Plastics and paint factory Zakłady Tworzyw i Farb in Złoty Stok	[9]
Gdańsk	HarcBajt	10/1987	ND	Scouts' computer club—Scouts' House in Gdańsk	[9]
Szczecin	Klub Mikrokomputerowy	104/1987	ZX Spectrum Plus (4 units)	Part of young electronics engineers club	[6]
Warsaw	BIT	4/1986	Amstrad	Family club	[16]
Warsaw	MERIZAP	ND/1985	Mera 302, 303, 305, Mera 400, IBM, Amstrad 6128, Commodore 64 (7 units), Commodore Plus 4, Spectrum (14 units), Timex (3 units), ZX 81	Industrial automation manufacturer Zakłady Automatyki Przemysłowej MERAZAP	[16]
Kozienice	ATARI	17/1985	Atari 130XE, 800XL, 1050, 12XC	No patron	[16]
Łazy	BAJT	15/1986	ZX Spectrum (2 units), Timex (3 units)	Scout Troop Command in Łazy	[16]
Warsaw	MIKROS	150/1984	ZX Spectrum, Atari 800XL, Meritum I, UNIPOLBRIT 2086	Radio manufacturer Zakłady Radiowe im. Marcina Kasprzaka in Warsaw	[36]

Source: original work based or reports in Bajtek.

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