**Analyzing the Role of Child Computer Interaction**

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**Abstract**

This paper examines the discipline and development of child computer interaction (CCI). It also determines whether there is an effect of Computers on Children’s Social Development. To describe and explain the nature of child computer interaction, I will first provide a historical look at this topic and pinpoints some of the crucial periods in its evolution. I'll also go over the ten pillars of child-computer interaction, which are: Work in interdisciplinary teams; Deeply engage stakeholders; Evaluate impact over time; Design the ecology, not just the technology; Make it practical for children's reality; Personalization; Mindful of skill hierarchies; Support creativity; Enhance human connections; Enable open-ended, physical play I will also describe how child computer interaction affects child development, can have on kids .Finally, I'll discuss the underlying cultural and societal beliefs about technology and children that guide decisions about what is valuable and beneficial for them.

Keywords: Child Computer Interaction, Social Development, Beneficial, Development, Evaluate

**Introduction**

The field of human-computer interaction (HCI) is dynamic. Child Computer Interaction (CCI) is a relatively new research area within the field of human-computer interaction (HCI). In its early years, it was primarily motivated by interests in the use of technology in education and schools. Since then, it has grown into a distinct community within the HCI field and is now beginning the process of maturing into its own discipline with its own associated methods and solutions.The HCI agenda has been impacted by changes in how people communicate, learn, work, and play. For instance, research is increasingly focusing on communication rather than control, playfulness rather than productivity, and user experience rather than usability.

As computers become more pervasive in our lives, especially those of children, the relevance of child-computer connection is rising.Children are learning, playing, and interacting with others in new ways as a result of their increased use of interactive computer gadgets as they grow up. Depending on how these computer interactions are created and how these tools are used, the changes that take place could either be positive or harmful. In order to have the greatest positive effect on children's development, interactive technology should be designed with children in mind. This field of study is known as child-computer interaction.

“It is difficult to pinpoint when CCI began; it could be justly argued that the first major works in this area were those by Papert (1980) and later Kafai (1990), Resnick (1991) and Ackermann (1991))”, Read and Bekker(2011).

After World War II, computers gained popularity and were primarily used for economic, scientific, and military purposes. A group of innovative researchers, including Seymour Papert, Marvin Minsky, and Alan Kay, started looking into the development of computer systems for kids in the 1960s and 1970s. In the long run, their work had broad implications, including the development of object-oriented programming, a vision for the use of computers in education, and early tablet and laptop design ideas. Their first aim was making computer programming accessible to youngsters (Kay & Goldberg, 1977; Papert, 1993).These pioneers were not alone in their interest in expanding the use of computers to a wider audience. An interdisciplinary group of researchers including computer scientists, psychologists, and engineers slowly began forming what is now known as the human-computer interaction field, focusing on methods for design, implementation, and evaluation of interactive computing systems. Encouraged by the release of IBM’s Personal Computer in 1981, they began organizing the Human Factors in Computing Systems (CHI) conference 1982, beginning as an official Association for Computing Machinery (ACM) conference in 1983 After brief bursts of work affected by both traditions in the 1980s, a more consistent flow of study on child-computer interaction started in the 1990s, with growing influences from communication studies, education, developmental psychology, graphic design, and these fields. The first Interaction Design and Children (IDC) conference, held in 2002, served as the catalyst for this trend.

Since that time, this annual meeting has served as the hub for research on children and computers.

Although its basis was mostly derived from the human-computer interaction discipline, it has over time included work from scholars who frequently publish in media studies and educational journals. The most recent examination of trends was presented during the conference by Yarosh et al. (2011).

**The 10 pillars of child-computer interaction**

The 10 pillars of child computer interaction are guidelines that provide lessons on how and what to design.(Hourcade 2015).

Pillar 1: Work in interdisciplinary teams Nowadays, design teams rather than lone people are more frequently used to create interactive technology for kids. The most effective programs typically have interdisciplinary teams, or at the very least, incorporate specialists in the specific kid group being targeted, technology builders (such as computer scientists and engineers), and people with experience in design and assessment methodologies (e.g., children, parents, teachers, psychologists, educators). Most teams also comprise a designer (graphic or industrial), as well as authorities on the subjects the technology touches (e.g., if it is digital library software, a librarian).(Hourcade 2015)

Pillar 2: Deeply engage with stakeholders As a general guideline, the design team should engage with stakeholders more actively the less familiar they are with them and the situations in which they will utilize technology.In addition to finding it challenging to recall what it was like to be a kid, adults need to understand that every generation of kids has its own requirements, interests, and viewpoints towards technology. Children should be involved at all stages of the design process for this reason. In the field of child-computer interaction, we prioritize child-centered design, much as academics and practitioners in human-computer interaction call for user-centered design.Children are not the only ones who are impacted by the technologies they use; parents and other people, including teachers, who engage with children should be involved in the design process as well. Similarly, meeting stakeholders is frequently insufficient; it is also necessary to understand about their everyday lives and the circumstances in which technology will likely be employed.(Hourcade 2015)

Pillar 3: Evaluate impact over timeWhen using technology, kids typically don't change right away. Since skills and capacities develop over time, it is necessary to observe how technology impacts children over a long period of time in order to fully comprehend its impact. This is the pillar of child-computer interaction that is currently least used, primarily because there aren't enough resources to examine new technology.(Hourcade 2015)

Pillar 4: Design the ecology, not just the technology Context has a big impact on how we use technology. For this reason, it's crucial to consider the larger context of use when creating technologies for children in addition to just the device itself. Additionally, design teams have the option of designing the entire ecology of use. In other words, design the environment in which the technology will be used rather than just the technology itself. You might even consider the potential users of the device as well as any supportive activities.(Hourcade 2015)

Pillar 5: Make it practical for children’s reality A device created for kids needs to function in kids' actual environments if it is to be successful. Although it is frequently important to begin the design process in a lab, designs should take into account the situations in which kids are likely to use technology and if they are appropriate for those circumstances from the outset. Designs that are flimsy, heavy, painful, fragile, or harmful are unlikely to have an impact. The lives, needs, and interests of children should be relevant to technologies.(Hourcade 2015)

Pillar 6: Personalize Children come to the usage of technologies with various life experiences, skill sets, neurological architectures, and physical make-ups. Their wants and passions are varied. Some people might be impaired cognitively, motorically, or perceptually. Because of this, personalisation can significantly improve how useful technology is for kids. It is critical to note that this is even more crucial for kids than for adults, as younger kids are more likely to exhibit a wider range of demands and skills than older kids or adults.(Hourcade 2015)

Pillar 7: Be mindful of skill hierarchies The learning process in many fields, such as music and education, entails mastering the fundamentals before building on them with more difficult skills. Design teams must take into account the fundamental abilities required for using interactive technology and guarantee that the kids who will utilize it have those abilities. Again, skill hierarchies should be taken into consideration if kids are learning skills through technology.(Hourcade 2015)

Pillar 8: Support creativity If learning is done with a goal that is important to the child, like producing or building, it might be more motivating. This concept is the cornerstone of constructionism, a theory of child development developed by Seymour Papert that has had a significant impact on the study of child-computer interaction. Papert's work and his main influences have focused on making it possible for kids to program computers with results they can identify with, whether it is creating robots out of LEGO bricks using LEGO Mindstorms or drawings in the Logo programming language. With interactive technologies now supporting a wide range of additional creative activities including storytelling, music authoring, three-dimensional design, smart textiles, and so forth, the child-computer interaction community has substantially expanded on this theme.(Hourcade 2015)

Pillar 9: Augment human connections If learning is done with a goal that is important to the child, like producing or building, it might be more motivating. This concept is the cornerstone of constructionism, a theory of child development developed by Seymour Papert that has had a significant impact on the study of child-computer interaction. While computers can frequently obstruct these interpersonal relationships, they can also strengthen them. Papert's work and his most significant influences have been in this direction. Communication and collaboration technologies have received a lot of attention in the field of child-computer interaction, and many of them now offer face-to-face interaction via touchscreen, tactile, and full-body user interfaces.(Hourcade 2015)

Pillar 10: Enable open-ended, physical play Children who engage in active, open-ended play can gain several advantages, such as improved health, the ability to negotiate and advocate for themselves, the development of problem-solving abilities, and resilience . With numerous examples of computer-enhanced indoor and outdoor physical play, the child-computer interaction community has pushed to support this type of play. (Hourcade 2015)

**Methods**

In a randomized control trial, researchers gave over a thousand kids free personal computers to use at home in order to examine the effects of home computers on children's social development. The randomized control experiment lessens worries about selection bias brought on by the decision of which families will buy computers.(Fairlie and Kalil 2016)

At the start of the study, none of the kids included had a computer. The other half will function as the control group, while half are chosen at random to receive free computers. 1,123 students in grades 6 through 10 from 15 different middle and high schools across 5 school districts make up the sample for this study. The initiative lasted for two years, from 2008–09 to 2009–10. The 15 schools included both large and small, urban and rural, schools, and geographically. 97 percent of the are in grades 6–8, and the majority of the schools is in middle schools.(Fairlie and Kalil 2016)

The female to male student ratio is 50 to 50 and the student to teacher ratio is 5 to 1. However, the schools that the experiment participants attend are less affluent , which is why the experiment's requirement that participants not own a computer at home is necessary.(Fairlie and Kalil 2016)

At the start of the school year, an in-class survey is performed with every student attending one of the 15 schools to determine which kids did not already have home computers. The Children are not informed that the poll would be used to decide their eligibility for a free home computer in order to promote honest responses.(Fairlie and Kalil 2016)

No training or support is given with the computers because the project's main objective is to estimate how home computers affect children's social participation rather than to evaluate a more extensive technology policy intervention.(Fairlie and Kalil 2016)

**Results**

There were three key places where the experiment's data were gathered. We started by conducting a thorough baseline survey, which was necessary to take part in the research. The survey contains thorough data on household and child variables. Second, for the whole academic year, each school gave us comprehensive administrative data on each student's attendance at school. Finally, we conducted a follow-up survey at the conclusion of the academic year that contained thorough social development questions. 85 percent of the kids had their follow-up questionnaires collected. The response rate for the control group was 84.3 percent, whereas the response rate for the treatment group was 85.4 percent

There is almost no attrition in the administrative data on school participation that the schools report. Numerous national computer use surveys have found that kids utilize their home computers for both academics and enjoyment. The results also imply that youngsters are using computers more frequently for both socially isolating and socially engaging activities, such as playing games and using social networking sites.It is very unlikely that child behavior would have changed for any reason other than the computers themselves.(Fairlie and Kalil 2016)

**Conclusion**

I looked into some of the early attempts to comprehend the field of child computer interaction while preparing this paper. I also looked at the history of CCI, the 10 CCI pillars, and how computers affect children's social development. I've discovered that there is still much to learn about the new subject of research known as "Child Computer Interaction."

There are additional indicators of social progress that are significant and warrant investigation. Furthermore, by strengthening ties between home and school, personal computers may improve social and academic growth. Children are more likely to report teaching their parents how to use the computer, which is a definite advantage of having one at home.

**Discussion**

Do computers help kids make real-world connections with their peers and classmates or do they make them feel more socially isolated and stunt their social growth? Surprisingly little trustworthy research has been conducted on this subject. We offer the initial relevant findings using a randomized control experiment. As part of the field study, more than a thousand children from 15 different schools were at random handed computers to use at home. We found that having a home computer enhances kids' total computer use for social networking and email, as well as for games and other forms of entertainment.

Furthermore, there is no proof that kids who are given computers at random are any less likely to join after-school clubs or sports teams or to devote any less time to them. Overall, the findings show a pattern of somewhat beneficial effects on young people's social development and little evidence of growing social isolation, at least in terms of the outcomes we have examined here.

The term "child-computer interaction" refers to the design, evaluation, and use of interactive computer systems for children as well as key phenomena that are connected to them. As they get older, kids are using interactive computer devices more frequently, which has an impact on how they study, play, and interact with others. The changes that occur could be advantageous or detrimental depending on how these computer interactions are designed and how these technologies are used. Child-computer interaction is the study of how to create interactive technology that children can use effectively to optimize its developmental benefits. Therefore, to understand all the advantages and negative side effects of CCI, we must continue our investigation.(Fairlie and Kalil 2016)

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