Technology Diffusion and Its Impact on Children

Thomas Woodson, Assistant Professor, Stony Brook University

Across the world new technology has become a core factor in development and wealth creation – but technology does not automatically promote development or lead to a reduction in poverty. Depending on the characteristics of the technology and on how it is used, who gets to use it, and how the wealth and other benefits it generates are distributed, technology can help reduce inequality or make it worse (Cozzens and Kaplinsky).

Scholars discuss two types of inequality related to technology diffusion: vertical and horizontal inequality (Stewart, Brown, and Mancini). Vertical inequality refers to general income inequality between individuals, while horizontal inequality measures inequality between groups based on factors like race, gender, religion, and age. Technology can increase both types of inequality in interesting ways. For instance, new information and communication technologies (ICTs) created time-saving innovations and a few high-skill computer jobs, but they destroyed many lower-skill clerical jobs (Freeman, Soete, and Efendioglu). As a consequence, structural unemployment and vertical inequality both increased. Obviously, children in households with unemployed workers are at a greater risk of falling deeper into poverty.

Technology's impact on horizontal inequality is particularly pernicious because such inequality can persist even as a country as a whole gets wealthier (Cozzens and Kaplinsky). In one study, researchers in the USA investigated whether minority children received a new asthma treatment at the same rates as other children. The study found that minority children had a slower adoption rate of this treatment and that the adoption rate for children as a whole was lower than for adults (Ferris et al.). This new medicine did not diffuse evenly, and it increased horizontal inequality.

Recently, scholars have studied the impacts of nanotechnology on poverty. Nanotechnology is an emerging technology that uses matter from 0-100 nanometers in size to create novel products. Many believed that it would be useful for both rich and poor households by creating cheap solar cells, water filters and medicines (Invernizzi and Foladori). However, scientists found that the technology has not had a big impact on poverty because nanotechnologies are directed towards issues faced by the rich and do not match the social context of developing countries (Cozzens et al; Invernizzi and Foladori). For example, most of the R&D on medical applications of nanotechnology focus on rich-world adult diseases like cancer and Alzheimer's. Over ten times fewer nanotechnology publications are dedicated to diseases that affect poor children, like neonatal infections and diarrheal diseases, despite the fact that childhood diseases cause more deaths than cancer and Alzheimer's (Woodson).

In addition, nanotechnology firms are not developing products that can help poor children. It is estimated that there are 1,800 nanotechnology-based consumer products on the market, and only 37 of them are designed for children (Woodrow Wilson International Center). The products that are designed for children, like mold-resistant stuffed bears and antimicrobial baby bottles, are only accessible to children in wealthy nations. Currently, the nanotechnology revolution is bypassing children, especially poor children.

Some technologies can decrease inequality for children. In the ICT sector, the Hole in the Wall (http://www.hole-in-the-wall.com) programme installs computer terminals in poor areas so that children can play and learn independently (Mitra). This progamme was started in India in 2001 and has spread throughout the country. In the field of health technologies, graduate students developed a low-cost incubator for hypothermic infants in order to decrease childhood mortality rates (embraceglobal.org). The incubator is now in 11 countries and has helped over 50,000 low birth weight and premature infants (Embrace). In both of these cases, the technology was designed for children in developing countries rather than being retrofitted from a rich world innovation. Designing technology for a specific context is one way to increase the likelihood that the technology will help the targeted recipients (Cozzens et al.).

A common argument is that the benefits of technology will trickle down to poor people (Donald). For instance, many environmental technologies, like electric cars and recyclable products, are designed for rich consumers, but the benefits from the innovations will eventually trickle down to poor children because a cleaner environment alleviates many health consequences associated with pollution (Evans and Kantrowitz).

Trickle-down development is possible in a few scenarios, but often the innovations never reach poor people. In many cases, the economic and political system is structured so that it is impossible for the technology to trickle down (Donald). For example, intellectual property regulations prohibit technologies from being used without paying licensing and royalty fees. If scientists want to develop a technology for poor children, those fees could be prohibitively expensive. Relying on a trickle-down process is not an effective way of ensuring that the benefits of technology reach poor people.

As shown, technology can dramatically improve a child's life, but it can also lead to more inequality depending on how it is used and implemented. To make technologies that decrease inequality and benefit all children, scientists and policymakers must develop pro-poor technologies that directly target vulnerable children (Cozzens and Kaplinsky), addressing their needs and tailored to the contexts in which they live.

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