From the Instructor

Namank Shah's analysis of the One Laptop Per Child (OLPC) project reminds us of the important lessons of failure. As Namank ably points out, in development projects, idealism is not enough: it must be accompanied by a careful and detailed assessment of need that is in turn complemented by cultural understanding and awareness of community acceptance.

Namank's essay carefully outlines the failures of the OLPC project. His assessment draws on the tenets of appropriate technology, one of which is community control of engagement with new technologies.

As Namank suggests, in a methodical and clear-sighted manner, the limitations of the OLPC project can teach us a great deal about our assumptions of the uses of technology in developing countries and about the rightful place of humility alongside knowledge in the pursuit of development goals.

— Deborah Breen

NAMANK SHAH

A BLURRY VISION:
RECONSIDERING THE FAILURE OF THE
ONE LAPTOP PER CHILD INITIATIVE[1]

In 2005, MIT professor Nicholas Negroponte unveiled an idea so innovative that it had the potential of improving the lives of millions of people in developing countries around the world—a $100 laptop. His vision was to distribute this low-cost, rugged computer to the poorest children in elementary schools in developing nations, help them gain access to knowledge, and allow them to explore and experiment with the latest technologies. He founded the One Laptop per Child organization to transform his vision into reality. Backed by the United Nations Development Programme, OLPC received a lot of commendation and acceptance from various leaders and the media. However, as the time of shipment neared, problems began to surface. Among other issues, the cost of the laptop rose to $188, the initial buyers began to back out, and IT support was minimal. As a result, the OLPC foundation failed to achieve its expected sale of 150 million laptops by the end of 2007. By 2009, only a few hundred thousand laptops had been shipped to the developing nations.[2] Today, the OLPC initiative is often cited by critics as a failure. However, instead of dismissing the laptops as disappointments, it is important to examine the cause of their decline. This understanding can prevent impediments in the future when trying to implement some other form of information and communication technology in developing nations. Careful analysis about the culture and necessities of the children needs to be done in the countries before shipping the laptops. Laptops need to be customized to local traditions and customs, so that they are appropriate in their new context. Despite its initial setback, the OLPC initiative can improve its success rate by letting

go of its Western ideals and adapting its laptops to the appropriate needs of the children who are using them in the developing countries.

The actual distribution of the laptops points to an obvious failure of the program. When OLPC was first founded, it only took orders in lots of 1 million. However, no developing nation could risk the capital necessary to buy these 1 million laptops, especially if there was no data proving the benefits of the program. OLPC was then forced to lower the minimum purchase number to 250,000 laptops.[3] The founders initially thought that a lot of countries would be willing to pay for these laptops *en masse*, which would ensure cheaper production costs for individual laptops. However, the target nations do not have that much money; therefore, the minimum deployment size had to be lowered over time. As a result of such unrealistic goals, delivery of the laptops was low. Figure 1 shows the actual number of laptops distributed in specific countries by the OLPC foundation.

Country	OLPC Web site	Actual Deployments	Date of Actual Deployment Information/Detail
Uruguay	202,000	150,000	November 2008
Peru	145, 000	40,000	100,000 in distribution
Mexico	50,000	50,000	Starting to be shipped
Haiti	13,000	Dozens	Pilot began in summer 2008
Afghanistan	11,000	450	Expected to rise to 2010
Mongolia	10,100	3,000	G1G1 laptops beneficiary
Rwanda	16,000	10,000	Arrived, not deployed; infrastructure issues
Nepal	6,000	6,000	Delivered April 2007
Ethiopia	5,000	5,000	Three schools
Paraguay	4,000	150	4,000 planned next quarter
Cambodia	3,200	1,040	January 29, 2009
Guatemala	3,000	—	Planned before third quarter 2009
Colombia	2,600	1,580	January 25, 2009; agreement to buy 65,000 XOs
Brazil	2,600	630	February 6, 2009
India	505	31	January 20, 2009

Figure 1. Worldwide Distribution of XO Laptops[5]

The first number is the data shown on OLPC's main website, and the second number is the actual number of laptops in the various schools. A major cause of discrepancy between the two numbers is that the OLPC website does not distinguish between ordered, shipped, or delivered laptops. Even then, the actual numbers are low, and the global distribution is sparse. Out of the machines that were delivered to the various schools, it is not safe to assume that they are all actually being used by the children. In Uruguay, "27.4 percent of machines were out of commission in a recent poll, or more than 100,000 out of the 400,000 in the country."[4] Of the laptops deployed within Uruguay, one in every four laptops was not used by the schools because of malfunctioning and lack of technical support. This issue further reduces the number of active laptops within the OLPC project and amplifies the failure of the project. Similar numbers would also be found in other countries; however, no research has been done yet to support this claim. The evidence clearly suggests that the OLPC project fell significantly short of its initial goals of providing millions of children with its XO laptops.

A major reason for the failure of the OLPC program, which would account for its low distribution numbers, is the belief of the recipient nations that the laptops were not appropriate for them. When implementing new technologies, it is important to look at whether or not the technologies are appropriate for the target region in order to avoid unwanted consequences. As Kelvin Willoughby, a professor at Curtin University, Australia, explains, "The Appropriate Technology notion points to the need for knowledge of a diversity of technical options for given purposes, careful analysis of the local human and natural environment, normative evaluation of alternative options, and the exercise of political and technological choice."[6] This definition shows that there are a lot of factors about the technologies and the environment they are to be raised in that should be considered before bringing the technologies to the new region. The governments of the developing nations did not carry out this "careful analysis," and, therefore, the adoption of the laptops led to unforeseen consequences. This inappropriateness of the OLPC laptops "might stem from [their] being deployed in a context quite different to that for which [they were] designed."[7] When existing technologies are transferred from one region to another, they may be inappropriate because of the new culture in that region. It is necessary to evaluate the differences and anticipate problems

before moving the technology. Although the OLPC laptops were designed and tested for use in developing nations, the mere idea of laptops is a Western one, which contributed to its inappropriateness.[8]

Willoughby also claims that "there is frequently a range of alternative technological means available which are suitable for the attainment of primary objectives within a given field."[9] It is not enough for the technology to work—it needs to achieve the goals in the most efficient manner, with the least detrimental effects on the society. Therefore, a careful analysis of several candidates needs to be done before selecting a particular technology. According to the concept of technology choice, users need to assess short-term and long-term advantages and disadvantages of each of the options before adopting new technologies. However, "in this project there was no evaluation of competing technologies. In fact there was not even a slight consideration given to alternative solutions."[10] When the OLPC was founded, there was no significant competition. No other laptop distribution project had done work on such a global scale. However, the lack of competition does not guarantee that OLPC's laptops are appropriate. With the development of the Intel Classmate and other netbooks, which tapped into the same market as OLPC, the governments were now faced with more choices to assess for their needs. OLPC was no longer their only option, and this increased competition also played a role in the downfall of OLPC. OLPC was unable to evaluate the needs of the people that were to get these laptops, and therefore lost to its competition.[11] As G. Zachary, a professor at Arizona State University, notes, technologies are "push[ed]" at Africans "that are inappropriate for them simply to benefit [Westerners'] own need for vanity and for moral reinforcement."[12] Especially in Africa, critics claim that there are several issues, such as HIV/AIDS and malnutrition, that are more immediate and need to be addressed before education. Forcing the technologies on developing nations leads to several undesirable consequences.[13] These unwanted results can lead to further resentment and to the dismissal of the OLPC laptops.

One specific example of an undesirable consequence with the OLPC projects was the rise of curiosity in the children, which could lead to rejection of support from parents. David Tablot, a proponent of OLPC, writes that "when . . . students own the computer, they begin finding 'why.' They realize they can actually do something that is meaningful to them."[14]

The Internet opens up a world of possibilities for the children using the laptops. They begin to question things around them and try to be like others. The founders of OLPC think of this curiosity as appropriate and encourage it even more. However, in the context in which these laptops were deployed, they may sometimes bring forth unwanted consequences among the children. One such undesirable result is the westernization of the children. Some researchers are concerned about "the possible influence of western ideas on local cultures . . . With access to the [Internet], children were more vulnerable to disorientation from their cultural beliefs and to migration towards a more westernized culture."[15] The children's curiosity also expanded to their cultural beliefs, and a lot of them questioned their customs and adopted Western standards. In conservative nations, which are the developing countries targeted by OLPC, culture is very important to the people, and the introduction of this new technology threatens to deteriorate that among the children. Therefore, the parents are skeptical toward, and often resent, the new technologies that their children are using in the schools. Without support from parents, future expansion of the program may be in danger.

Another drawback of the OLPC project was the forcing of Western ideas on children in developing nations, which often led to criticism and resentment about the project. In her paper, Victoria MacArthur notes that "the personal computer . . . [has] been designed with western metaphors in mind, and . . . the interface is quite natural for [Westerners]. [Companies] cannot deploy these same interfaces 'as is' without any regard for cultural differences."[16] Computers were designed to be used by people in the English-speaking world. From the layout of the keys on the keyboard to the display of the icons on the screen, the computers show a great deal of Western culture and influence. OLPC's target is developing nations, which do not have the same cultural understanding as Westerners and therefore do not benefit as much from the same laptops. As researcher Emmanuel Yujuico concludes, "OLPC's design . . . reflects Western biases toward individual agency, but studies in social psychology and anthropology have found meaningful differences in Eastern and Western cognitive processes."[17] The specific hardware and software designs of the XO laptops used by OLPC reflect predispositions toward Western ideologies about individualism, which are not understood by the people from other cul-

tures who are the actual users of these laptops. Therefore, they receive the laptops with confusion and ambiguity, which is not what OLPC expected in its vision. Professor Zachary, a critic of OLPC, argues that companies "tell [Africans] that they ought to accept these technologies . . . They ought to have more personal computers. They ought to have better seeds. They ought to do this and they ought to do that."[18] It is important not to force the new technologies on developing countries just because some innovators and leaders in developed nations have a new idea to transform these countries. Zachary claims that the developing nations need to accept the technologies on their own in order to ensure long-term sustainment of the new technologies. He gives the example of the quick and successful adoption of cell phones by Africans, which was because they themselves wanted these phones. Similarly, when developing nations realize the need for laptops, they will readily accept them. Thus, OLPC can avoid criticism by rethinking its vision and ideals and making sure that it is not forcing the laptops on the children in developing nations.

In order for the OLPC laptops to be appropriate in their new environments, and to make future OLPC projects successful, it is necessary to make sure that the laptops adapt to the local standards and culture. Researchers from Italy concluded that "strategies of ICT integration . . . must be rethought and readapted to the cultural context, avoiding giving a laptop the whole responsibility for the success of the project for school innovation."[19] With the current strategy of OLPC of merely giving the laptops to the governments, there is a lot of pressure on the laptops themselves. People expect the laptops to bring changes and to empower the children. However, it is important to integrate the laptops to better fit the context and customs of the target nations. Several studies have concluded that the primary reason for the failure of the OLPC project was its lack of consideration for and adaption to the local cultures and societies.[20] An analogy can be made to the advertising industry, where marketers specifically make different commercials for the same product to be seen in different cultures in order to appeal more personally to their target audience. If OLPC is to improve its success rate in future projects and deployments, it must address this cause of failure and adapt its laptops to the needs of the children. For example, the OLPC laptops include the Tam Tam suite—a range of applications that allow the children to create their own

music. However, children form Uruguay "noted that the music authoring program was unable to create music which matched the beats of their local music."[21] Children felt that they could not customize the music to play the sounds they were accustomed to hearing in their cultures. As a result, they were reluctant to use the software again, which limited their creativity and showcased the need for OLPC to integrate cultural values more into their products. The OLPC partly utilizes the Bottom of Pyramid model.[22] However, it is important to note that "the BOP is not a monolithic block of 4 billion people. Entrepreneurs must learn to segment and leverage the enormous variation within even the local BOP."[23] Although OLPC is a nonprofit foundation, it still serves the same market. Currently, OLPC has the same deployment, support and design strategy for all children, regardless of the backgrounds of its users. Therefore, OLPC needs to understand the variations in its users in order to better serve them and gain more acceptance in the future. For example, a recent study concluded that "the possibility exists of using [the laptops] as a shared community resource between education and health care: one laptop per child equals one laptop per clinic."[24] In some countries, education is not on the top of the agenda. Problems like disease and hunger are more prominent and need to be solved urgently. Therefore, OLPC should be open to using their laptops for these purposes, which would better help the people than the intended use in the classroom. Then, OLPC's laptops would be more welcome among the children in the developing nations.

The One Laptop per Child program received a lot of praise during its unveiling but failed to meet its idealistic expectations. In order to ensure success in the future, OLPC needs to redesign not only its laptops but also its ideals and mission. With more understanding of the local customs and traditions, OLPC can provide customized laptops to the children, which could actually empower them and help Nicholas Negroponte's vision come true. The introduction of new technologies to a region is a highly sensitive process, and even a small mistake could lead to dire consequences. Especially with information and communication technologies, the principles of appropriate technology and technology choice can ensure the success of these new technologies and help prevent undesirable consequences. These concepts not only work for the XO laptops of OLPC, but they could also serve as a framework for other projects that aim to improve life for people

in developing nations. These ideas can guide the installation of the new programs and ensure their success. With careful analysis of and adaptation to local cultures, the new technologies can actually succeed in their goals and help make the world a better and developed place, one nation at a time.

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Notes

1.   I would like to thank Owen Dean and Professor Breen for their insightful comments and feedback for my draft during the group review process.

2.   Kenneth Kraemer, Jason Dedrick and Prakul Sharma, "One Laptop per Child: Vision Vs. Reality," *Communications of the ACM* 52, no. 6 (2009): 66.

3.   Mark Warschauer and Morgan Ames, "Can One Laptop Per Child Save the World's Poor?" *Journal of International Affairs* 64, no. 1 (2010): 36.

4.   Warschauer and Ames, "Can One Laptop," 41.

5.   Kraemer, Dedrick, and Sharma, "One Laptop Per Child: Vision," 68. This data is as of June 2009. More laptops have been shipped since then, but the data in the table has not been adjusted.

6.   Kelvin Willoughby, "Introduction: The Concept of Technology Choice," in *Technology Choice: A Critique of the Appropriate Technology Movement* (Boulder, CO: Westview Press, 1990), 7.

7.   Ibid., 5.

8.   For further analysis, see page 6.

9.   Willoughby, "Introduction," 8.

10.   Linus Andersson and Thomas Norrmalm, "Finding the Formula for Sustainable ICT: Lessons from the One Laptop Per Child Project in Rwanda" (Thesis, Uppsala University, 2010): 30. http://uu.diva-portal.org/smash/record.jsf?pid=diva2:300573.

11.   For analysis of this drawback, see page 8.

12.   Nico Colombant, "Some Development Experts Criticize 'One Laptop Per Child' Initiative in Africa," *Voice of America*, March 7, 2011. http://www.voanews.com/english/ news/africa/Some-Development-Experts-Criticize-One-Laptop-Per-Child-117528273. html.

13.   For other examples of such imposing of technologies on other nations, see Everett Rogers, "Consequences of Innovations," in *Diffusion of Innovations,* 5th ed. (New York: Free Press, 2003), 436–471.

14. David Talbot, "Una Laptop Por Niño," *Technology Review* 111, no. 3 (May/June, 2008): 64.

15. Kenneth Kraemer, Jason Dedrick and Prakul Sharma, "One Laptop Per Child (OLPC): A Novel Computerization Movement?" (paper presented at the 44th Hawaii International Conference on System Sciences, 2011): 4.

16. Victoria McArthur, "Communication Technologies and Cultural Identity: A Critical Discussion of ICTs for Development" (paper presented at the IEEE Toronto International Conference: Science and Technology for Humanity, 2009): 913.

17. Yujuico, "Cautions from One Laptop Per Child," 10.

18. Colombant, "Some Development Experts."

19. Andrea Mangiatordi and Magda Pischetola, "Sustainable Innovation Strategies in Education: OLPC Case Studies in Ethiopia and Uruguay," *Organizational, Business, and Technological Aspects of the Knowledge Society Pt II* 112 (2010): 99.

20. See Kraemer, Dedrick and Sharma, "One Laptop Per Child (OLPC): Novel," 4; Kraemer, Dedrick and Sharma, "One Laptop Per Child: Vision," 66; Mangiatordi and Pischetola, "Sustainable Innovation," 95; and Victoria MacArthur, "Communication Technologies," 912.

21. McArthur, "Communication Technologies," 913.

22. Under this model, companies try to serve their products to those who make less than $2 a day. By targeting the untapped market of the poor, the idea is to make a profit while also doing charity.

23. Renee Kuriyan, Isha Ray and Daniel Kammen, "How to use Technology to Spur Development," *Issues in Science and Technology* 24, no. 2 (Winter 2008): 73.

24. Paul Fontelo et al., "Extending the Benefits of One Laptop Per Child to Health," *BMJ* 337 (December 01, 2008): 22. doi:10.1136/bmj.a2459. http://www.bmj.com/content/337/bmj.a2459.short.

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