

Name: Mitra Sadat-Akhavi

Title of the Book: Stephen Hawking's Biography

Author: Kristine Larsen

What role did assistive technology play in this book?

The book, *Stephen Hawking a Biography* by Kristine Larsen is about the life of the infamous scientist Stephen Hawking. Stephen Hawking was born on January 1942 in Oxford. At the age of 21, he was diagnosed with Amyotrophic Lateral Sclerosis (ALS) and the prognosis of death within two years.

Today, Stephen Hawking is still alive and one of the most prominent astrophysicists. Due to the gradual loss of control of his body, Hawking has had plenty of time to adapt to his situation. However, this gradual loss of functionality brought a face of uncertainty to his life. Walking would become increasingly difficult, leading to the need of a wheelchair, arms and hands became weaker, so, eating and writing would become challenging. Speaking and swallowing also would become labored. Finally, the only muscles that are left untouched are heart and muscles involved in digestion and waste elimination, and the sexual organs, with a fully functional brain. Despite the fatal prospect of this disease and the loss of functionality of his legs he got married in 1965.

The first assistive technology, Stephen Hawking used was a wheelchair. After he caught pneumonia from one of his business trips, he could no longer communicate (through speaking or writing). He described that he was literally trapped in his mind.

The only way he could communicate was through use of his eyebrows when someone pointed to the correct letter on alphabet card. Walt Woltsoz, computer expert, provided Stephen with a communication program which he had developed in order to assist his disabled mother-in-law. The program had a built-in speech synthesizer. The original device had electrodes attached to his head to enable him to select words displayed on a computer screen. However, one of Hawking's students adapted the device to a handheld controller, similar to a computer mouse, allowing him to click on words and phrases to compose sentences. For the first time after a very long time, Stephen Hawking was able to write and speak without a help of another human being. Stephen's nurse's husband, a computer engineer, was able to mount a computer screen, and speech synthesizer to his electric wheelchair, allowing him to communicate without being chained to a desk.

In 2000, Stephen's deteriorating body lost control of his hand which was used to control his computer. In 2005, he used Infrared/Sound/Touch (IST) switch developed by

Name: Mitra Sadat-Akhavi

Title of the Book: Stephen Hawking's Biography

Author: Kristine Larsen

Words+. The device is attached to his eyeglasses and its low power Infrared beak is controlled by blinking an eye or otherwise moving a cheek muscle.

What did you learn about the interaction of disability and technology?

Stephen Hawking remains who he is today because of the technology he is using. He can only communicate with others through his computer and move using a power wheelchair. It is interesting that the interfaces that he uses to interact with the technologies are rather unconventional. Many assistive technologies are designed with interfaces that require hand motions or voice commands to operate, but because of his unique condition he had to take advantage of the only muscles he controlled (first his cheek, later his eye movements). It is important to remember that assistive technology has to take advantage of the individuals, to cater to their unique needs.

How did the book effect you? Did it change your opinion, or confirm existing beliefs?

This book was very inspiring to me. Despite his disease which disabled him to perform even the most basic human functions, he remains to be a researcher and a great scientist of our time. This story confirms my beliefs in our duty as a society to enable all individuals to be functional and productive, so that they may contribute to the progress of our civilization with their unique talents and abilities. We wouldn't know who the future brilliant minds will be, unless we give everybody the chance to reach their full potentials.

Do you think the author's identity effected the way it was written and how?

Kristine Larsen is an associate professor of physics and astronomy at central Connecticut state university. I suspect that due to her career in physics and her personal interest in the work of professor Hawking, she mainly focused on academic part of Stephen Hawking's life. Although it was fascinating to learn about all the theories and characteristics of black holes and wormholes and other cosmic phenomenon, I thought that the major part of the book was based on his academic life rather than his personal struggles.

"I would like to be thought of as a scientist who just happens to be disabled, rather than a disabled scientist."

Stephen Hawking