is it good?
Consider the statistics. Currently, there are some 2 million nursing home beds in the United States. About 78 percent of the occupants need assistance getting on and off the toilet. It is anybody’s guess as to how many others in the general population—young and old alike—suffer similar indignities.

Or ponder these statistics. Only a tiny fraction of the written material in American libraries is readily available to people with serious vision problems. Stephen King’s latest thriller may make it to Books on Tape. Not so the latest research on immunology in the prestigious journal *Nature*. Denying access to printed information has consequences for the lives of blind people. Only 45 percent of those with major vision impairments graduate from high school. That total compares to 80 percent of their fully sighted counterparts. As adults, only 30 percent are employed versus 84 percent of sighted individuals.

Or consider this predicament. An estimated 19 million people in the United States suffer from urinary incontinence. Plenty of popular remedies such as disposable pads and diapers exist. But they are so bulky and clumsy to use that many of those afflicted by the problem simply restrict their activities and suffer humiliation in private.

If the students in Arizona State University’s InnovationSpace program had their way, such physical disabilities would present only minor inconveniences, not insurmountable barriers.

InnovationSpace is a product design and development laboratory. The program brings together teams of top students from such diverse fields as business, engineering, product design, and communication design. During an intensive two-semester course, the teams bone up on everything you need to know to get a product off the drawing boards and onto store shelves. Students log long hours. For example, they interview users and craft market analyses. They chart revenue projections and field test prototypes. They also detail manufacturing specifications and develop product identity—complete with a company name.

At the end of the school year, students in the program are required to showcase models that are convincing replicas of real-life products. They build professional-looking displays that are stocked with everything from a product brochure and packaging to a business prospectus. To top it off, they must pitch their ideas to an audience consisting of faculty, students, local business entrepreneurs, and reporters.

The late Paul Rothstein founded InnovationSpace on a new model of product design and development called Integrated Innovation. An associate professor of industrial design, Rothstein passed away while this story was being written.

To help guide them through the Integrated Innovation process, students methodically work through a matrix of four questions:

- **What is desirable?** The question asks students to explore the needs and wants of potential users.
- **What is possible?** Answering this question prompts students to seek out the most appropriate technology.
- **What is valuable?** Students seek to identify gaps in the marketplace where their products can be best positioned.
- **What is good?** Addressing this fourth question makes Integrated Innovation a unique and sustainable model of new product development.

During the 2004-2005 academic year, three ASU student teams worked on developing products for an underserved segment of the American population—aging Baby Boomers. About 78 million of these folks are now poised for retirement.

The other half of the class worked on developing text-reading aids for people who are blind or seriously visually impaired. Their work was based on a device known as the iReader. Currently being developed by researchers at ASU’s Center for Cognitive Ubiquitous Computing (CUbiC), the iReader can translate printed text into an audio file in a matter of seconds.

Rothstein developed InnovationSpace as a way to better equip his students to meet the practical as well as economic and ethical challenges facing the design profession and society. Product innovation is just one example.
Rothstein routinely told his students that such innovation is no longer the domain of a lone genius sketching a design concept on a café napkin. Instead, consider this nugget from a 2004 article in BusinessWeek magazine. The reporter wrote that the creation of new products now is a collaborative process of “engineers, contract designers and manufacturers, university scientists, and dozens of technology suppliers big and small—all pulled together ad-hoc for a particular product.”

With its segregation of disciplines, however, Rothstein believed that university education did little to prepare students for this real-world challenge. So the ASU professor created an opportunity for students to get their feet wet in the classroom. To ensure that the experience would be cross disciplinary on all levels, he assembled a team of faculty members to participate in the project. The team includes Mookesh Patel from graphic design, Jim Hershshauer from business, and Mark Henderson from engineering. Program coordination is provided by designer Kate Benjamin.

Senior industrial design student Sergio Baiza says that it was just this chance to absorb lessons from professors in other disciplines and to collaborate with some of the best and the brightest students from fields of study across campus that attracted him to InnovationSpace. Baiza spent the summer of 2004 as an intern in a local design firm. He watched as engineers and marketing people were frequently thrown together to develop products. “I knew InnovationSpace would prepare me that much more for the workplace,” Baiza says.

InnovationSpace is helping to prepare students for other demands as well. The manufacture and disposal of products are culprits in many serious environmental problems. As part of the Integrated Innovation process, students devise ways to tackle problems of waste and pollution by creating timeless, classic designs instead of throwaway trendy ones. They learn to minimize the use of materials, find cleaner manufacturing processes, and make products easier to repair or break apart for recycling.

Keeping the social good and a sustainable future in mind makes good business sense. Meredith Holmes is a business finance major. She served as a member of the Boom Design team. The team created a device known as the Assist. It is designed to help people with mobility impairments get on and off the toilet. “Just look at the sheer number of people who are getting older,” Holmes says. “Problems come along with aging. Many of these areas haven’t been explored.”

Unlike their creators, however, student projects rarely graduate from the classroom to the marketplace. Quentin Smith hopes to change those odds. Smith is president of Arizona Business Accelerator Inc., a Phoenix-based business catalyst. He attended many InnovationSpace classes and presentations to offer students tips on making their products more marketable.

Christy Sutphen is a graphic designer and Boom Design team member. She says that her experience in InnovationSpace has inspired her to dream of forming an entire company based on products that eliminate societal stigmas such as those attached to physical disabilities. “I’m thankful for the day that Paul created this class. It’s a once-in-a-lifetime experience,” she says. “It’s going to affect us for the rest of our lives.”

**INNOVATIVE SAMPLES**

Six teams of ASU students participated in InnovationSpace during the 2004-2005 academic year. Half of the teams worked on designing products for aging Baby Boomers, 78 million of whom are poised on the brink of retirement. The remaining three teams developed products that utilize a new device, known as the iReader. The device is being developed by computer scientists at ASU’s Center for Cognitive Ubiquitous Computing (CubiC). iReader technology captures written text via a digital camera. The text is then “read” by optical character-recognition software and fed into an audio file. A synthesized voice relays the text to listeners—all in a matter of seconds. Students designed three different products utilizing the iReader technology: a desktop unit, a portable unit, and a wearable unit.

**IREADER DESKTOP**

Sergio Baiza, Industrial Design; Linh La, Graphic Design; James Villarreal, Aerospace Engineering; Lee Anne Shaffer, Business Finance; Company Name: Decipher

“My biggest dream is to walk into a library, pick up a book and be able to read," said one member of a focus group made up of people with severe visual impairments. The iReader Desktop may help to make this dream a reality. The device uses a variety of textures, grooves, and raised surfaces. The text-reading device communicates via touch to help users with limited vision operate it with speed and accuracy. "We live in a fast-paced information age," says business major Lee Anne Shaffer, a member of the Decipher team. “A person who can’t access printed information quickly is at a disadvantage. There’s no reason why people with visual impairments shouldn’t have equal access to the same information that everyone else does.”
Imagine sitting in a restaurant unable to read the menu. Or waiting at a bus stop and not being able to see the transit schedule. Or standing at a washing machine without being able to determine the temperature of the wash cycle. For people with visual impairments, these small daily tasks often become major obstacles. Enter Rogo eyeglasses.

Rogo is an acronym for “reading on the go.” Incorporating CUbiC’s iReader technology, Rogo includes two components. Tiny digital cameras embedded in the corners of the eyeglass frames capture information on a page. The information is read aloud to users via an audio earpiece. A small palm-held computer allows users to take notes or edit the text.

**Portable i-reader**

Daren Nybo, Industrial Design; Malinda Carlton, Graphic Design; Ryan Evans, Business Management; Drew Shepard and Aaron Moncur, Bioengineering; Kelly Durret, Accounting; **COMPANY NAME FETCH**

One of the most powerful predictors for success in school and on the job is the ability to read. Mastering reading skills can be an insurmountable obstacle for youngsters with severe visual impairments. Members of team Fetch discovered that only 45 percent of students with severe visual impairments graduate from high school. That number compares to 80 percent of their fully sighted classmates. Team Fetch members saw a clear opportunity to improve the educational experience of people who are visually impaired. Their product is called i-reader. A portable camera unit transmits printed text via a wireless connection to a speech-output device. The i-reader fits handily on most classroom desks.

**Atlas**

Luisa Lambe, Industrial Design; Alan Luu, Graphic Design; Krystle Gomez, Marketing; Tiffany Sadowski, Business Management; Michael Meyer and Chad Welker, Mechanical Engineering; **COMPANY NAME INTEGRATED GENIUS**

As people age, the risk of serious injury due to falling or lifting heavy weight increases exponentially. For many elderly adults, houses become obstacle courses. Arguably, no space in the home is fraught with more hazards than the average garage. Team Integrated Genius worked to minimize the risks of tripping over power tools or straining backs while lifting heavy boxes. The team created a storage-shelf unit that moves belongings up and out of sight at the touch of a button. Operated by a simple motor, the Atlas offers overhead storage that can hold up to 500 pounds. When lowered, the shelves can be positioned to a desired height, eliminating the need for bending or reaching. When retracted, the unit maximizes the underutilized space of garage ceilings while keeping floor space cleared of dangerous clutter.

**Conties**

Stephanie Recalde, Industrial Design; Michael Davis, Graphic Design; Jared Hardman, Business Management; Adam Scheck and Anthony Pettoruto, Mechanical Engineering; **COMPANY NAME AGE+ON PARTNERS**

Before the members of Age+On Partners introduce their new undergarment for people who suffer from urinary incontinence, they like to take the audience on a drive-by of the competition: bulky pads and diapers, catheters, and clunky-looking underwear. “Which of these products would actually instill pride in the user?” asks industrial designer Stephanie Recalde. She says their alternative is intended to restore a sense of normalcy to those who suffer with incontinence. Conties is a washable undergarment specially designed to hold up to four thin pads. When soiled, the top pad can be easily removed by opening a flap in the front of the garment. Conties comes to hold up to four thin pads. When soiled, the top pad can be easily removed by opening a flap in the front of the garment. Conties comes in a variety of styles and fit—from conservative cut to active wear—to meet the needs and tastes of users. Best of all, it generates a fraction of the solid waste produced by more traditional products.

**What is good?**