**Buried in bills? So are most college students**

By Jennifer Schur

The New York Times reported this week that more college students are borrowing money to pay for college than ever before; the amount of educational debt students are leaving school with has increased as well.

The slow-down of the nation’s economy has affected far more people than just those in your parent’s generation; in fact, it has probably affected you and your peers.

The New York Times reported Tuesday that there’s been a significant rise in educational debt. The number of students who took out loans to cover the costs of tuition has risen in the past ten years, from 46 percent to 70 percent of high school seniors. Marie Mons, the Director of Student Financial Planning and Services, said that a similar trend has not been seen here.

“In general, Georgia Tech students are not borrowing excessively for their undergraduate education,” Mons said. “The average indebtedness of our undergraduates when they leave Tech is approximately $17,000. When you compare this to other institutions, it’s not that onerous.”

When considering that tuition and fees at private and public universities have more than doubled in the last two years, it seems inevitable that grants must also increase; however, they have “not nearly kept pace with the cost of higher education,” Mons asserted.

“The truth is, it’s a lot easier to increase aid than grants,” said Ken Redd, research director of the National Association of Student Financial Aid Administrators, in the Times. “Until now, those loans have been a very good investment, but the concern I hear now is, ‘With the economy the way it is, how long is that going to last?’

“Students don’t know what the future holds, and so more students are [being forced to] turn to borrowing because of inadequate savings, how they thought they’d pay was changed by the economy, [or] they hadn’t planned,” said Mons.

Tech students’ loan volume has increased by seven percent in the past year, and the number of people taking out loans has increased five percent in the past year. These increases are the result of many factors, including students’ understanding and know-how to get loans, explained Mons.

Up until the present, Tech’s average aggregate indebtedness has been well below the national average, said Mons. The school’s default rate is extremely low, as a factor of a generally low national indebtedness and well qualified, employable graduates who are able to pay back their loans.

National default rates are at historically low levels, down to 5.9 percent in the fiscal year 2000 from 22.4 percent in 1990, the New York Times reported.

There are many reasons that contribute to both a low default rate and why more students are borrowing money to obtain a higher level education. The kinds of students Tech attracts and the kind of degrees offered are factors.

The economy is another clear factor. While the economy has adversely affected savings, since accounts might not be earning as much as they were expected to several years ago, it has also affected the job market. For students depending on jobs as another source of income to help pay for school, the economy deals a double blow to their financial plans.

To counteract this, Brown University eliminated work study for freshmen and has instead chosen to give our scholarships. Princeton University, however, has a similar system.

**Meow for new Cat Cove litter box**

By Kimberly Rieck

Senior Staff Writer

Ever have a cat and notice how smelly, ugly and tedious taking care of litter boxes can be? Litter boxes generally are not the most fashionable pieces of furniture or decorations in one’s home.

However, one Georgia Tech student is trying to change the misconception that a cat litter box has to be unfashionable, ugly and disgusting.

Stephen Griffin moved from New York City to Atlanta with his wife this past summer to earn his graduate degree in Industrial Design from Tech. Griffin earned a Bachelor of Fine Arts from Furman University and a Master of Fine Arts from the Parsons School of Design in New York City.

He worked in electronic game development before he came Tech, where he realized that he wanted to get more involved in hands-on design of products that could benefit people and the home.

When he came to Atlanta with his wife and his two large cats, Sumo and Sassy, the family had to settle for a smaller apartment than the one they had in New York City.

Griffin began to notice the hassles of sharing a small apartment with two large cats; Sumo and Sassy weigh eighteen pounds and sixteen pounds.

The apartment was too much empty space, especially not for a large, smelly, unwieldy litter box. “I love my cats, but not their litter box. Through research, I found that I was not alone,” said Griffin.

For his first class project, Griffin’s professor assigned the class to improve a common household object. Griffin immediately decided to improve the litter box. He described the traditional litter box as:

Unfashionable, ugly and disgusting.

Stephan Griffin’s redesign of the kitty litter box won third prize at the International Housewares Show in Chicago earlier this month.
“I love my cats but not their litter box. Through research, I found that I was not alone.”

Stephen Griffin
Industrial Design grad student

into the cove. The hole has additional purposes besides acting as a kitty sun-roof. Not only does the hole allow air to circulate throughout the Cat Cove, but it also enables the owner to pick up the litter box from multiple sides.

When it’s cleaning time, the Cat Cove opens to reveal a removable litter pan. The owner uses a sliding door to clean the litter pan there or slide the litter pan elsewhere. The owner can take the pan anywhere because it is designed to allow the owner to lift, pull, grab and push easily. The Cat Cove can also be flipped over to accommodate any type of living arrangement and configurations.

The pan can be placed on top of the Cat Cove so that the owner can clean it from a standing position, as opposed to traditional cat boxes. One has to kneel down and clean a litter box placed firmly on a floor, according to Griffin.

Another convenient feature is that each part disassembles to make it easier to clean.

Not only did Griffin get to apply a class project to his household needs, he was able to use it to win a coveted award from the U.S.’s largest trade show, the 2003 International Housewares Show in Chicago, held Jan 12-14 and sponsored by the International Housewares Association.

The International Housewares Show had over 17,450 buyers in attendance and 56,000 visitors, including manufacturers. The total size of the show was 786,000 net square feet.

The exhibits were in the following categories: Electronics and Home Healthcare; Home Organization; Cleaning and Furniture; Kitchen and Dining; and Decorative Accessories.

Winners from the design competition were given the opportunity to exhibit their work for free over the weekend, allowing them to make connections to suppliers, manufacturers and other companies.

Out of all of Georgia Tech’s applicants, Griffin was the only one who placed in the competition. He won $1,000 and a free trip to Chicago. More importantly, he was able to showcase his Cat Cove. “I was very happy that I won third place in the IHA competition. It gave me the opportunity to meet several potential manufacturers,” said Griffin.

By the end of the weekend, Griffin had received many inquiries from companies, including Petsmart, about his product. Not bad for Griffin’s first Industrial Design project ever.

While continuing work on his degree, Griffin plans to pursue the inquiries into his design and turn it into a possible manufacturing deal.

“Hopefully, cat owners everywhere will soon be able to have a Cat Cove,” said Griffin.

In the future, Griffin would like to go into designing children’s toys and games.

Kitty
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nothing more but a box with a hole in it. He interviewed friends who had cats for the project and visited several pet stores before he began work on his prototype.

Griffin’s idea was to create the Cat Cove to address the problems that cat owners in small apartments and homes face. The problems Griffin wanted to address were: sight line to the litter, aesthetic form and preventing the cat from scattering litter outside of the litter box. The Cat Cove also possesses features that aid in the cleaning process of the box, and it allows for greater flexibility of location when placing the litter box inside the home.

During the whole design process, Griffin tested the product out on his cats at home. He knew he had a success when one of his cats began to sleep in one of the Cat Cove prototypes (without any litter in it at the time).

The Cat Cove is unique in the aspect that the litter pan is accessible by the cat but hidden from the owner’s view. The cove also combines the litter mat with the litter box to prevent the tracking of litter outside of the cove.

Griffin designed a constrained entryway to make sure the cat walks along the ribbed service. A four-inch hole in the top allows light to enter
The color of cancer: nanoparticles offer new detection method

By Kimberly Rieck
Senior Staff Writer

Associate professor Shuming Nie is trying to dramatically improve clinical diagnostic tests for the detection of cancer through the use of quantum dots, a type of nanoparticle. Quantum dots glow and act as markers on cells and genes, thereby allowing scientists to rapidly analyze biopsy tissue from cancer patients. Through early detection, doctors will be able to provide more effective therapies for cancer patients.

Nie is a chemist by training. In addition to his duties as an associate professor in the Wallace H. Coulter Department of Biomedical Engineering, a joint department with Georgia Tech and Emory, Nie serves as director of cancer nanotechnology at Emory’s Winship Cancer Institute.

Scientists in the field of nanotechnology build devices and materials one atom or molecule at a time, creating structures that have the ability to take on new properties by virtue of the minuscule size of nanoparticles. A nanoparticle, the basic building block of nanotechnology, is measured in nanometers (a nanometer is one-billionth of a meter). Basically, a nanometer is 100,000 times smaller than the width of a human hair.

Think about a nanoparticle in terms of an apple. You can slice an apple several times and it will still taste sweet. However, if you continue to break the apple into smaller and smaller pieces until the nanometer scale, it will lose its taste and have completely different properties, according to Georgia Tech Research News and Publications.

The use of nanotechnology in biomedical applications has been a relatively new development in recent years. Until a few years ago, nanotechnology’s use was constricted to electronics, manufacturing, supercomputers and data storage. Nie, however, saw the potential for nanotechnology. Years ago, he published a paper on how the first major breakthroughs for the nanotechnology field would be in biomedical applications, for example in imaging, drug delivery and early disease detection.

“Electronics may be the field most likely to derive the greatest economic benefit from nanotechnology. However, much of the benefit is unlikely to occur for another ten to twenty years, whereas the biomedical applications of nanotechnology are very close to being realized,” said Nie in an interview with Georgia Tech Research News.

Before he became the Georgia Cancer Coalition Distinguished Scientist, Nie worked as a researcher at Indiana University. At Indiana, Nie and his colleagues made a nanoscale semiconductor crystal, also referred to as a quantum dot. The quantum dot has the limited ability to conduct electricity and is made of semiconductors.

Since quantum dots are 100,000 times smaller than the width of the human hair, their electrons are compacted; their electrons are so compacted that it causes them to emit light and thereby act as a fluorescent tag. Quantum dots have the ability to bond chemically to biological molecules and trace specific proteins in cells. Nie refers to quantum dots as “bioconjugated nanoparticles,” which, in simple terms, means that the small particles are chemically linked to biological materials.

Nanoparticle probes have several uses. One is as a contrast marker in MRIs or in positron emission tomography (PET) for in-vivo molecular imaging. Another is as a fluorescent tracer in optical microscopy. The “tags” trace specific proteins in cells for cancer diagnosis and can monitor the effectiveness of drug therapy.

Using the dots’ glowing, bright, fluorescent colors, scientists hope they might in the future improve the sensitivity of diagnosis tests for molecules in cancer cells, or even the AIDS virus, that are difficult to detect through traditional tests.

Nie plans to apply the quantum dots to early detection, quantification and localization of gene sequences, proteins, infectious organisms or genetic disorders. The practical applications of nanoparticles are

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possible because the particles absorb and emit different colors in the light spectrum as their sizes change. For example, a piece of gold appears to the human eye yellow in color. Converted to nanoscale size, gold can appear red or blue when broken down.

The use of a spectrum comprised of six colors and four additional colors in the infrared spectrum enables scientists to apply nanoparticles to tracking tasks traditionally done by organic dyes. Organic dyes have several negative flaws. Dyes fade more quickly than nanoparticles and can be toxic to cells. Additionally, dyes have to be used separately because each dye requires a different light wavelength in order to be visible. On the other hand, nanoparticles need just one laser beam for illumination.

At this point in time, scientists have only been able to vary a quantum dot’s size slightly. A quantum dot glows in one of ten colors. By embedding differently-sized dots into tiny beads made of a polymer material, scientists have found that the color of the bead can be tweaked. A bead with tiny combinations of color has the potential to tag a million different proteins or genetic sequences. The Bioplex Corporation, spun out of Nie’s lab research in Indiana and directed by Tom Perzinger, holds the exclusive license from Indiana University for the synthesis of multiplexing dyes for imaging and detection. The Bioplex Corporation is one of many start-up companies on the roster at EmTech Bio, a business incubator run by Georgia Tech and Emory. Scientists have begun studying ways to link quantum dots to medical drugs and other therapeutic agents to target cancer cells. Potentially the dots could deliver a controlled amount of a drug to particular cell type. Working with Emory University cancer urologist Lelund Chung, Nie has begun to work on using quantum dots as molecular probes to analyze biopsy tissue from cancer patients.

In this scenario, the nanoparticles would profile a large number of genes and proteins simultaneously. Physicians could then create unique cancer treatments for individuals based on the molecular differences in the patients’ cancer cells. Cancer patients with similar cancers sometimes respond differently to the same treatment because each cancer cell has different genes and proteins. Other applications that Nie and his colleagues are working on involve delivering quantum dots into specific kinds of tissues and cells, thereby making cancer therapy more selective.

By using near-infrared imaging technology, they have begun monitoring the migration of the particles within cells. Nie has also begun to collaborate with tissue engineers at Georgia Tech and Emory on using nanoparticles to construct new materials to be applied in improved implants for damaged tissues. Bio-nanomaterials have enabled scientists to explore new opportunities in cell and tissue engineering recently.

With Nie and his colleagues’ work, Georgia Tech and Emory have been able to remain on the cutting edge of cancer research and technologies.
from previous semesters, and they seemed much easier."

Judy Kao, a second year Industrial Engineering major, agreed. "The tests were most definitely harder," she said. "I also think the grading was stricter, too, because of collaboration [compared to CS1321]."

CS TAs disagree, however, but are generally hesitant to share their opinion. "The tests were longer," said one CS1321 TA. Another TA added, "But the tests were not comparatively harder. Not was the homework."

"[On the tests], we tried to ask more questions that were similar to homework questions — kind of a test to see if they did the homework," the TA above said. She admitted, "I know we talked about it, like, 'Oh, this question is kind of hard, but that's okay because they did it on their homework,'" but was quick to point out that out of the five or six questions per test, each test had about two questions that were extremely similar to homework questions. Aside from the tests, however, most students thought being able to collaborate was a good thing. Eiselt said, "The survey responses we've received indicate that most of the students think the new collaboration policy is beneficial."

"It was nice to have people to collaborate with," said Hsu. "I know that for the first few projects I collaborated with others because I didn't understand Java syntax at first."

"I went to my TA, but somehow I found that the explanations I got there and in class weren't helpful. I learned the most with working with my friends. So in that sense, collaboration was great," said another second year CS student. "It didn't really make a difference for me, collaborating or not, since I guess I had already sought help from friends back when collaboration wasn't allowed," another student said, referring to the past semesters' policy that heavily restricted students from discussing homework with others. "The only thing different now is that since it is allowed, I'm more relaxed about asking other people for help and working together on homework. Also, I can ask more people."

For first semester freshmen that hadn't experienced classes under any thing besides the new collaboration policy, one freshman AE major said, "I took advantage of the collaboration policy all the time." She added, "I went to the TA lab all the time, but the TAs were more helpful for learning concepts, but it's kind of inconvenient to ask them late at night."

"I needed time was probably another factor for the students. At a school where heavy workloads are a way of life, in this respect, collaboration may have hurt more than helped."

Said one 1321 TA, "The collaboration has simply delayed the learning process. Students, in a time crunch, have available to them the option of copying homeworks at the last minute, using the collaboration policy to bail them out."

"Come test time, it was very obvious who had collaborated," said another TA. "Swapping code is fine if you do study it afterwards, but I think I did have that problem, when I felt rushed to finish P0 or P1," said Hsu. She concluded, in that respect, "It's hard to say whether collaboration helped or not."

Eiselt commented, "In our survey, we ask students to give advice to their friends who might be taking the course. Many say that students should take an active role in their education and use collaboration as a tool to help learn the material."

"Students should take an active role in their education and use collaboration as a tool to help learn the material."

Kurt Eiselt
Academic Professional for the CoC

The collaboration policy implemented in introductory computer science classes for the first time last semester was both liked and disliked by students; the passing rate was not drastically different from previous semesters.
Tech Up Close

email: focus@technique.gatech.edu

Winner of the Tech Up Close contest receives a Technique T-shirt and a coupon for a free student combo at Li’l Dino’s.

Last week’s Tech Up Close:
I-beam in the Student Center Parking deck

Last week’s winner:
Mark Shefrin