Thursday, October 31, 2013
United States Senate Committee on Health, Education, Labor, and Pensions
"Attaining a Quality Degree: Innovations to Improve Student Success."
Testimony of William E. "Brit" Kirwan, Chancellor, University System of Maryland

Chairman Harkin, Ranking Member Alexander, and Members of the Committee, I am Brit Kirwan, Chancellor of the University System of Maryland (USM). I am pleased to join you today to discuss the potential offered by the various elements of what has come to be called "academic transformation"—the implementation of new teaching and learning paradigms made possible by the effective and innovative use of information technology.

By way of background, the University System of Maryland comprises 12 institutions, including research institutions, comprehensives, historically black institutions, one specialized research institute, and a totally on-line university. That institution—the University of Maryland University College (UMUC)—is recognized as a global leader in interactive and online education. In fact, UMUC's expertise and experience were an enormous advantage as we worked to expand that approach across the USM. And given that the UMUC model is so well understood, I will focus my comments today on our residential institutions.

We are, in many ways, a microcosm of public higher education and—as such—in an enviable position to design and test the different types of academic transformations. In fact, over the past several years, USM has emerged as a national leader in the academic transformation arena.

Before examining the implementation and impact of our efforts, I believe it is important to step back and consider the impetus for our actions as well. From my perspective, a confluence of developments surrounding the higher education enterprise both compel us to reexamine and reengineer our operations, and present us with a unique opportunity to embrace truly transformative change.

First, recent years have seen the issue of college completion move to the forefront of our national higher education conversation, with an emphasis on the STEM disciplines of science, technology, engineering, and mathematics. The reasoning behind this was inarguable: In today's innovation economy, where knowledge and skill are the coin of the realm, education beyond high school is an imperative. Our

nation simply must produce more well-educated, highly-skilled citizens. To secure America's global economic leadership, President Obama has set a national goal of recapturing leadership in college completion by 2020. The Gates, Lumina and other major foundations have made college completion a top priority, and are matching that rhetoric with substantial funding. And the National Governors Association has embraced college completion as its number one goal. Unfortunately, just as the importance of college completion was being elevated in the public's consciousness, a systematic disinvestment in higher education—especially public higher education— was accelerating, further complicating our challenge. Given that the rate of tuition increases we have seen in recent years is simply unsustainable, if we in higher education are to meet our responsibilities to the nation, we simply must find a more cost-effective way of delivering high quality instruction and education to our students.

Second, we are seeing advancements in technology that we have barely begun to exploit. The reach and speed of communications technology combined with the adaptability and flexibility of software is transformational. And for higher education, this manifests itself in both sophisticated online learning platforms and innovative classroom approaches.

Finally, the cognitive research that has occurred over the past few years has dramatically increased our understanding of how people learn, process, and retain information. We have seen real breakthroughs in understating the triggers in the brain that imprint information. The importance of active engagement, collaboration, and social interaction—which has long been suspected—has been confirmed.

And so we find ourselves at a fascinating time and place. We are deep into the "new normal" of heightened expectations and reduced resources—the proverbial "do more with less" situation. And, we are standing at the crossroads of advances in cognitive study and the exploding power of technology. The potential for the use of sophisticated technology to simultaneously improve learning outcomes and address the cost of education delivery is the most exciting development that I have seen in my 50-year career in higher education.

Now, I must stress that I do not believe that technology represents some sort of "magic bullet" to fix all the ills in undergraduate education. I am not calling for higher education to cast aside every aspect of the traditional approach and start anew. That would be an enormous mistake.

At the same time, we have to acknowledge that the thoughtful and strategic use of technology in higher education has enormous potential to improve outcomes while reducing costs.

Unfortunately, right now there is a lot of hype about the use of technology and online education. And, there are plenty of examples of where institutions have

bought into the assumption that technology is the answer without evidence that this is actually the case. My sense is that while we absolutely need to actively pursue innovation in teaching and learning using these powerful new technologies, we also need to insist on evidence that learning is improved and costs are moderated before we adopt these strategies on a wide scale basis.

It was precisely with this understanding and approach that the USM became the first university system in the nation to take advantage of the capabilities of technology and innovative educational techniques to redesign entire courses—not just individual classes or sections.

Our initial course redesign used the National Center for Academic Transformation model, drawing on the expertise of a pioneer in the Academic Transformation movement, Carol Twigg. Dr. Twigg studied the inefficiency that often plagues the multi-section, lower division, general education courses that exist on most campuses. She observed that students in these courses were essentially captive participants in a passive learning environment. Looking for a better approach, she ran a controlled experiment on 30 campuses: small liberal arts colleges, state flagship universities, and elite private institutions. Each campus had to teach sections of a course using her strategies, which were based on active learning, technology enhanced tutorials, and fewer formal lectures. In every case—all 30 institutions—the redesigned Twigg sections scored higher on the finals and had a cost that was the same or lower than that of the traditional sections.

The USM launched 10 pilot projects using these "hybrid classes" in which direct contact with the instructor is augmented by technology-driven, collaborative, interactive learning, with immediate feedback to students. These pilot projects were implemented across several disciplines, underscoring the wide applicability of course redesign. Biology, English, Mathematics, Nursing, and other disciplines were all involved.

As one example, the University of Maryland Eastern Shore (UMES)—one of the USM's three HBIs—redesigned its "Principles of Chemistry I" course. The new approach utilized an on-demand online tutorial, additional technology-assisted instruction, and regularly posted progress reports for students. The redesign also reduced weekly classes from three to two, which freed instructors up for more one-on-one assistance. In the redesigned course, the student pass rate increased from just over half to almost 70 percent, and the consolidation of course sections cut costs substantially. As a result, all sections of the "Principles of Chemistry I" are taught using this redesign model.

Frostburg State University's "General Psychology" course offers another worthwhile example. The psychology department collapsed the course's 18 sections into six, reduced in-class meetings by half, added computer lab time, and trained undergraduate learning assistants to provide tutoring. The redesigned course requires fewer faculty members (freeing full-time faculty to teach higher level

courses), shows improved learning outcomes, and significantly reduces the cost-per-student.

A somewhat more technology-heavy approach to course redesign was undertaken at Carnegie Mellon University through its Open Learning Initiative (OLI). Drawing upon the expertise of its cognitive science faculty, they are developing computer enhanced learning modules and online tutorials—with intelligent tutors built into the software. Essentially, an understanding of how people learn is directly integrated into intelligent, technology–based platforms. These platforms utilize intelligent software to promote adaptive learning, which in turn uses analytics to gauge progress. The learning outcomes produced at Carnegie Mellon were similar to the Twigg results, both in terms of improved outcomes and controlled costs.

Two of our institutions, The University of Maryland, Baltimore County (UMBC) and Towson University, were among six public universities in Maryland and New York that took part in an important study, using OLI software, funded by the academic consulting group Ithaka S+R. Students in the introductory statistics courses on the six campuses were split into two groups, one taking the traditional classroom-based course, the other taking the OLI computer-assisted course. All the students took the same standardized statistics test and final exam. The fact that students in the hybrid course did just as well as those who took the conventional course was an under-reported story. It was, in fact, incredibly significant news. The hybrid approach allowed students to make more efficient use of their time, spending about 25 percent less time on the course—both classroom and online—for the same test results. In addition, as a Towson professor noted, students had come away with a "deeper understanding" of statistical concepts than seen in conventional courses. In fact, UMBC now teaches its first courses in statistics using the OLI software.

And just as impactful as the academic results, were some of the ancillary results. Most notably, while just about all the professors that went into the study did so skeptically, by the end just about all of them acknowledged a much more positive outlook for these redesigned course. We have seen this phenomenon across our academic transformation efforts. Getting the first cohort of faculty to come on board was like pulling teeth. But in short order, these men and women went from being the biggest skeptics to most enthusiastic supporters of our efforts. They essentially seeded the ground, growing a whole new group of committed faculty members. Now we have far more faculty that want to take part in course redesigns than we can accommodate.

So with funding from Lumina, the Carnegie Corporation, and others, we dramatically expanded our efforts. We have employed both the Twigg model and the OLI model.

To date, the USM has supported the redesign of 37 courses, which enrolled more than 12,000 students during spring semester 2012 alone. In addition, course redesign leaders within the USM have worked closely with other publics, private

institutions, and community colleges to facilitate the redesign of an additional 31 courses across the state.

During this current academic year we are initiating the redesign of 48 additional courses, serving more than 12,000 additional students, essentially doubling our efforts. Our preliminary results indicate exactly what we had expected, and hoped: learning outcomes, pass rates, and retention are improving at the same or lower costs.

Course redesign was our first large-scale implementation of academic transformation principles, and our success in this work has led us to explore additional innovative practices and models. The USM is currently working with Ithaka S+R on a $1.4 million grant funded by the Gates Foundation. We are investigating ways that some Massive Open Online Courses (MOOCs)—provided by Coursera and the Open Learning Initiative—might be incorporated into existing university courses that are part of designed curricula at our institutions. While stand-alone MOOCs are becoming increasingly prevalent, the manner in which academic credit might be earned still remains to be studied. Our challenge is determining whether or not MOOCs, or portions of them, can be used to enhance learning in credit-bearing courses making higher education degrees more attainable.

In our project, Ithaka and USM are conducting 12 side-by-side comparisons and 11 case studies at institutions across the system. Some sections are using the Coursera MOOCs in the so-called "flipped classroom" model, other sections are being taught in the traditional way. The results of this experiment will be known this coming summer.

To further advance all our academic transformation efforts, the USM has created a new Center for Innovation and Excellence in Learning and Teaching (CIELT) that will bring together faculty and administrative leaders from across our 12 institutions to determine ways to improve the learning of students. We will assess trends and design projects to compare new ways to deliver courses with our current processes. By analyzing results and carefully collecting both quantitative and qualitative data on the process, challenges and resources required, we will be able to assess costs and determine ways to make the learning process more efficient and cost effective for the students, while using the knowledge, skills and talents of our faculty to their fullest. As a result of careful documentation of successes and problems, we will be developing information about best practices in our institutions. Bringing our efforts to scale and insuring sustainability are vital and the CIELT will play a pivotal role in accomplishing this, in Maryland and beyond.

The focus on this work, combined with support from the state and leadership from the USM and our institutions, is creating a culture of innovation involving the USM, community colleges, and private and independent colleges and universities in Maryland. The work performed by the USM institutions thus far led to the state

providing $13 million in enhancement funds. A major portion of that funding is going to additional investments in course redesign activities and the enhancement of academic innovation on the campuses.

As I referenced earlier, an important issue we have faced in our efforts to bring innovation into the classroom is how to get faculty engaged in these innovation efforts. We realized that this could not be a top down mandate. We also realized that these innovations are hard work and require serious efforts. After all, we are asking faculty to think about a new paradigm for instruction. Taking these factors into account, we have adopted a two-pronged approach.

First, we provide faculty with release time to devote to innovative course redesign and provide departments with incentive funds. We have set standards for what a course transformation must include: active learning, technology enhanced support, and side-by-side comparisons so we can measure learning gains or losses and cost of delivery.

Second, we conduct workshops and assign mentors for faculty entering this activity. At this point, we have a cadre of "experts" on these new teaching and learning strategies, which we designate as Faculty Teaching Innovation Fellows. The Fellows hold workshops and provide support throughout the pilot phase for faculty starting new projects. The results of this approach are clear: from a modest beginning of a dozen or so faculty executing course redesign efforts, we now have more than 200 faculty actively engaged in our innovation agenda.

I'll conclude my remarks with two final points. First, the extent to which the reauthorization of the Higher Education Act recognizes the impact of academic transformation and supports its advancement will be a key determinant as to its long-term success. I encourage you to make it a priority.

Secondly, while I am excited about the work we have done and the progress we have experienced within the USM, we are still early in this movement. Every new approach has to be studied carefully and fully evaluated to make sure it has the desired effect: improved learning at the same—or reduced—cost. Yes, I believe there is genuine potential in course redesign, hybrid classrooms, flipped classrooms, MOOCs and other elements of academic transformation. I also recognize that not all innovations will be successful. We must keep our expectations high for the potential offered by innovations and technology to substantially improve learning outcomes and contain costs. But we must do so in a thoughtful manner, insuring with evidence that course transformations produce the results we want before they are adopted on a wholesale basis.

Thank you very much for the opportunity to make this presentation.