Preparing for the Decade Ahead
The Decade Ahead. Two key questions:

1. What new skill sets will our students need to enhance their effectiveness and marketability?

2. What cross-cutting educational programs or academic degrees should we be offering?
Defining Our Educational Future: What’s Needed?

- Commitment
- Vision
- Openness
- Resources
- Buy-in
- Communication
Reflections on the Growth of the College
Dean Darrel Mase (1958-1970)

1958 Bachelor’s in Physical Therapy
1958 Bachelor’s in Occupational Therapy
1958 Bachelor’s in Medical Technology
1959 Master’s in Rehabilitation Counseling from the College of Education
1964 Master’s in Health and Hospital Administration

1974 Bachelor’s in Clinical and Community Dietetics

1975 Bachelor’s in Health Science

1976 PhD in Clinical Psychology (from CLAS)

1982 Physician Assistant program (from COM)

1992 Medical Technology program closed

1992 Clinical and Community Dietetics moves to IFAS

1992 Physician Assistant program moves back to COM
Dean Robert Frank (1995-2007)

1998 PhD in Rehabilitation Science
1998 Doctor of Audiology (with CLAS)
1999 PhD in Health Services Research
1999 Master of Public Health (with HHP and COM)
2000 BHS program redesigned for pre-professional students
2000 Master of Health Science in Physical Therapy
2000 Master of Health Science in Occupational Therapy
2004 MPH transferred to PHHP
2005 Doctor of Physical Therapy
Dean Michael Perri (2007-2018)

- 2008 PhD in Epidemiology
- 2008 PhD in Biostatistics
- 2008 MHS in PT closed
- 2009 Master’s in Biostatistics
- 2009 Bachelor’s in Communication Sciences and Disorders (from CLAS)
- 2009 Master’s in Communication Sciences and Disorders from (CLAS)
- 2010 Master’s in Rehabilitation Counseling closed
- 2011 PhD in Public Health (Environmental & Global Health)

- 2011 PhD in Public Health (Social and Behavioral Sciences)
- 2012 Master’s in Environmental and Global Health
- 2012 Master’s in One Health
- 2012 PhD in Public Health (One Health)
- 2013 Master’s in Epidemiology
- 2016 Bachelor’s in Public Health
- 2017 Doctor of Occupational Therapy
Current Status of our Programs
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<td>26th (among 73 programs)</td>
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<td>Physical Therapy</td>
<td>10th (among 201 programs)</td>
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<td>Speech-Pathology</td>
<td>28th (among 250 programs)</td>
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Numbers of PHHP Courses Taught Using a Partially or Fully Flipped Classroom Approach

- **Partly Blended**
- **Fully Flipped**
- **Total**

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NIH Awards to PHHP ($M)

- CY2011: $8.1M
- CY2012: $11.6M
- CY2013: $11.4M
- CY2014: $16M
- CY2015: $18.6M
- CY2016: $20.9M
- CY2017: $25.1M
Current Areas of Research Strength

• Neuromuscular Biology and Rehabilitation
• Respiratory Rehabilitation
• Cognitive Aging/Dementia Prevention
• Infectious Diseases/Vaccine Testing
• HIV/Substance Abuse
• Global Health/Environmental Health
• Pain/Pain Management
• Big Data/Epigenetics
• Swallowing Disorders
• Diabetes/Prediabetes
• Pediatric and Adult Obesity Treatment
• Driver Rehabilitation/Autonomous Vehicles
• Deafness/Language Development/Hearing Science
Community Service

Local
- Psychology Clinic
- Equal Access Clinics staffed by CHP, OT, and PT
- HealthStreet: Locations in Jacksonville and Miami, as well as in Gainesville
- OT SmartDrive Driver Rehabilitation Program

National
- “Our Community, Our Health” sponsored by HealthStreet

Global
- Haiti – Zika, Cholera, Malaria, STIs, Community Health
- Nicaragua – PT Training Program
- Mexico – Audiology Service Program
- West Africa – Ebola
- China – environmental health
Envisioning 2028

What new skill sets will our students need to enhance their effectiveness and marketability?

Example: Digital Literacy
Digital literacy empowers students to thrive in careers of the future.
ACCOUNTANTS WERE THE DATA SCIENTISTS OF THE 19TH CENTURY

- Skill demands evolve over time. For thousands of years few workers needed to know long division. Today it is mastered by 10-year-olds.
- The skills of today's digitally intensive workers will be the foundational skills of tomorrow.
- New technologies spread new skills. Digital innovations are rewriting the basic DNA of jobs.
The Blended Digital Professional

Workplace Skills
- Critical thinking
- Analytical reasoning
- Writing
- Communications

Domain Knowledge
- Cognitive Science
- Economics
- Finance
- Visual Arts

Business Skills
- Project management
- Decision making
- Visualization

Digital Skills
- AI / data science and analytics
- Big data and data management
- Software development
- Programming
- Information security
JOBS THAT INFUSE NEW SKILL SETS ARE GROWING FAST...

Projected Employment Growth: 2016-2026

...AND DELIVER HIGHER VALUE

Average Salary by Hybridization Category

- Very High: $89,747
- High: $73,177
- Moderate: $57,196
- Low: $66,236
- Overall: $63,652
ACROSS CAREERS
EMERGING SKILLS OFFER STRONG RETURNS

Salary premium for data skills across occupations

- Health care administrators: $8,000
- Supply chain/logistical manager: $15,000
- K-12 school administrators: $10,000
- Production plant managers: $33,000

Median salary vs. Data skill premium
The more tech- or data-enabled a job is, the more human skills matter.

Percent of Data Science jobs requesting key human skills vs. percent of all jobs:

- **Creativity**: 6% (Data Science) vs. 9% (All Jobs)
- **Teamwork**: 13% (Data Science) vs. 19% (All Jobs)
- **Problem Solving**: 14% (Data Science) vs. 22% (All Jobs)
- **Writing**: 22% (Data Science) vs. 27% (All Jobs)
- **Research**: 10% (Data Science) vs. 20% (All Jobs)

Legend:
- Orange bar: All Jobs
- Blue bar: Data Science (DSA) Jobs
A HISTORIC OPPORTUNITY FOR HIGHER ED TO BUILD THE TALENT BASE FOR FLORIDA’S DIGITAL FUTURE

Digital technologies are disrupting workforces and industries across Florida’s economy.

Workers and firms must develop new competencies to remain competitive.

Higher education has a historic opportunity to create the digitally enabled workforce for Florida’s future.
The Decade Ahead

What new cross-cutting educational programs or academic programs should the College be offering?
THE FUTURE OF HIGHER EDUCATION

ROBERT G. FRANK
In 2030

- the largest tech company on-line will be a not currently known education company
- Very little teaching by Power Point or lectures
Georgia Tech: Drivers of Change

Forces likely to drive change in higher education

- Technology driven disruption
- Shifting public attitudes toward higher education
- Changing demographics
  - “College is for 18 year old students” will devolve to life-long learning
Georgia Tech: 4 Drivers of Change

1. Eliminate artificial barriers between college and pre-college schooling
2. Invent flexible educational pathways and credentials that recognize continual learning
3. Reinvent the physical presence of a university for a world-wide population of learners
4. Create advising and coaching models for life-long learners
Georgia Tech: Needed Initiatives

1. Whole Person Education:
   
   1. Experiential learning that embeds the learning in authentic and relevant content
   
   2. Globalization at home --- critical thinking and collaboration taught in the context of multicultural world
   
   3. Curriculum emphasizes interpersonal and intrapersonal dimensions of education and cognitive dimensions
Georgia Tech: Needed Initiatives

Initiative 2: New Products and Services

1. Microcredentials to create efficient packages of experience and achievement
2. Minimester classes replacing the 3 SCH course--- more granular and flexible
3. Credit for accomplishments ---based on competencies and skills
4. Decentralized transcript based on blockchain technology to provide evidence of learning
Georgia Tech: Needed Initiatives

Advising: A new Era

1. Personalized advising
2. Technology enhanced advising
3. Personal Board of Directors for networks and coaching
Georgia Tech: Needed Initiatives

Artificial Intelligence (AI)

1. Pilots for mastery learning and adaptive learning platforms
2. Personalized tutors using AI to increase learning
3. Human centered AI to support development of interactive AI agents whose interactions with humans informed by cognitive models and contexts
Georgia Tech: Needed Initiatives

Distributed World Wide Presence

1. The Georgia Tech Atrium --- other locations—scalable or portals
   Could be located near clusters of Georgia Tech grads or co-working spaces
   Each atrium directed to needs of local learners

2. Living Library for Learning (L3)
   L3 portal provides on-demand access to individuals who provide first-hand experiences
2028 and Beyond

College will be “unbundled”

- Same disruptive process that has overtaken the news industry, banking, retail

Many universities and colleges may fail

- Survival of universities will depend upon innovation and efficiency
2028 and Beyond

In today’s university, success is measured by inputs: passing 120 SCH in a topic
- SCH do not translate to skills or competencies
- Southern New Hampshire University has received permission to give degree based on competency instead of seat time.
- Annual tuition for the experimental program is $2500
- 350 other universities have some effort on competencies
- More emphasis in employer-degree partnerships
2028 and Beyond

Bricks and mortar campuses will still be needed

- Students will obtain degrees much more quickly
- Basic material (introductory) will be taught by MOOCs or mini-presentations covering core concepts.
- Universities will be for the integration of material and application in new situations with emphasis upon critical thinking, communication, and problem solving
- More integration, or blurring of disciplines
2028 and Beyond

Students will gain basic knowledge and go to the university for integrated knowledge, network development, and experiential education

Courses may be taken at a much faster clip

Universities must adjust to offering this new model for teaching and financial success
2028 and Beyond

Project-based college environment will be more like a kindergarten class than a lecture hall
Knowledge is a commodity

- Education will be democratized and easily available
- Charging people high tuition for skills they could learn from a video is not likely to be a viable financial model
- The role of Ph.D. level faculty may be controversial
Now to 2028 and Beyond

Individualized learning will become more important

Big data will drive student recruitment and retention

- Student application material will be tailored to the preferences they express
- Information will be presented to match the student’s thinking
What We Need to Do

- More co-operative programs, more internships and a requirement for social contribution for more students in more programs
- More focus on the idea of the “communi-versity” and less on rankings and brand-status
- More focus on the D&D in R&D&D
- More investment in social and environmental capital
- More focus on the individual as learner than on “batch” learning and large class size - requiring pedagogic innovation and high levels of student engagement
- More varied forms of assessment to focus more on outcomes and impact
Key Attributes to Revolutionary Tech

Intelligence — the ability to sense or detect the environment and act on the information

Natural Interface — the ability to align with actions, traits, and intuitive schemes of humans as well as physics

Ubiquity — the ability to be omnipresent in previously discrete interactions
Now to 2028 and Beyond

Pervasive Computing: Embedded, Proactive, Networked Digital Processors

- Data is embedded and continually reconciled in public networks
- More difficult to corrupt data
- Pervasive computing is driving the internet of things (IoT) - really the internet of everything
Changing NOW

Universities are learning how to treat data “as an enterprise asset” and are integrating disparate data subsets into “a single analytics view,” James Wiley,
Changing NOW

Data is a strategic asset for a university

IT is moving from tech service to education technology
Changing NOW

At Georgia Tech, AI is addressing summer melt – loss of students who accept and don’t show up

- AI enhanced Charbot to answer questions
Now to 2028 and Beyond

Unlike traditional computing networks, pervasive computing networks are unseen, everywhere, and always on.

Not limited to one device or one location—distributed throughout the world we inhabit.

Pervasive computing is reforging established chains of business logic.

- Particularly true of the logic of value creation, which governs the interchange between the beliefs, values, and expectations of customers and the products, value chains, and practices of companies.
Now to 2028 and Beyond

Pervasive computing produces new forms of commerce by generating information companies can use to create value across a variety of products, services, and assets.

- Uber used this to increase bookings for airport runs
- Increased revenue to drivers and decreased cost to passengers

In health care, pervasive computing can make sensors and wearable technology tools to deliver precise interventions
Now to 2028 and Beyond

Wireless mesh networks (WMN)

- Challenges the hub and spoke connectivity model
- Only needs one connection to the internet
- Devices will form their own network off the grid
- Allows higher bandwidth than previously known
- Transforming supply networks by following RFID to provide remote tracking
- In healthcare, WMN will transform wearables and implantables to provide access in previously remote regions
Now to 2028 and Beyond

WMN will transform telehealth to reliable, virtually accurate communication
  • Will revolutionize how and where care is provided

Will change learning so that knowledge creators and learners simultaneously engage and create new concepts
Now to 2028 and Beyond

Biotechnology: Technologically Created and Enhanced Life-Forms and Systems

◦ Most significant application in genetic arena -- CRISPR-Cas system

◦ Learning

  ◦ Implant devices to educate and monitor critical systems
  ◦ Implantable devices act as brain prothesis increasing ability to handle deficits
Now to 2028 and Beyond

3D Printing: Digitally Designed, Chemically Manufactured Objects
- Additive manufacturing
- Can print anything from concrete to human cells
- We will be able to print with molecules
- Will transform commerce
- 3D printing still in early stages of developing the S curve
Now to 2028 and Beyond

Machine Learning: Augmented Automated Data Analysis

- Computer programs that “learn”
- Pattern recognition
- Combines computer algorithms, statistical patterns, and artificial intelligence
  - When bundled together, these unlock the cloud computing, big data, and artificial intelligence
  - Cloud computing separated storage from processing also allowing new forms of collaboration
Now to 2028 and Beyond

**Big data**
- Allows review of massive amounts of structured and unstructured data for new insights or relationships

**AI**
- Programming and algorithms that allow digital devices to access, combine, and share data to learn, explain, and forecast events, processes, and trends.
Now to 2028 and Beyond

Data
- Drives every company and organization
  - Structured – receipt, inventory list
  - Unstructured – tweet, video, blog
- Analytical range from monitoring and control (operational analytics) to forecasting and planning (strategic analytics)
- Machine learning can: analyze complex chains of cause and effect, as well as rendering a potential solution set of traditional and novel paths for moving forward.
Now to 2028 and Beyond

98% AI researchers are focused on engineering systems that will help people make better decisions versus simulating human consciousness.

Educators will understand student learning by how they apply concepts through the actions and decisions of students:

- This will lead to personalized learning for each student
Now to 2028 and Beyond

Nanotechnology: Engineered Atoms, Super-Materials

Designing and manufacturing incredibly small circuits and devices that are built at the molecular level of matter, typically 1 to 100 nanometers

- Promises new drug delivery systems
- Antibacterial bandages
- Nanomaterials like graphene and tungsten may help apply Moore’s law introducing a whole new era of higher speed computers with more memory
Now to 2028 and Beyond

Nanomaterials in golf balls result in straighter flight by transferring energy in the club directly to the ball

- Underarmor – “recovery” sleepwear lined with microceramic particles that absorb heat and reflect infrared radiation
- Nanoparticles can ferry drugs, heat, and light to human cells
- Nanorobots to transport cancer fighting drugs to tumors
Now to 2028 and Beyond

Robotics: Precise, Agile Intelligent Mechanical Systems

- Perform redundant tasks with high accuracy
- Robots can interact with humans and make routine conversation
- Da Vinci system allows robot to be directed by human surgeon
- 3D vision allows surgeon better view
- Robots can replace human instructors
- Enhanced teaching for people with special needs
Now to 2028 and Beyond

The Seven Technologies

◦ Will interact to create tools not previously known
◦ In healthcare -- Pervasive computing such blockchain will keep information decentralized, and closer to the patient
◦ Other practitioner data will be held closer to the clinics
◦ Machine learning can be added to blockchain to break down clinical trail and intervention sequence
BREAK OUT GROUPS

The chair denoted in each group is being asked to facilitate the discussion and to ensure both topics are covered. Please select a recorder and reporter for your group. They can be the same person.

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Morning Session Questions

1. What will be the demands from employers and society of PHHP graduates by 2028 (market needs)?

2. What skills and knowledge will PHHP students need by 2028 to be prepared to address important health issues?
Afternoon Session Questions

1. Identify at least 4 or 5 new cross cutting educational programs PHHP should be offering by 2028 (degrees, certificates). During discussion, list current strengths (and not yet fully realized areas) we can build on for these programs.

2. What current strengths and new skills and/or tracks do we need to integrate into existing curricula to ensure sustainability and function?
Summary and Next Steps