Education Technologies: Techniques for Teaching Quantum Computing

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The Research

- Teaching Methods
- Content Delivery
- Study Material
- Quantum Computing

The Survey – Teaching Methods

- If you were asked to learn something important to your career, what teaching method would you most resonate with (The topic is Computer Science related)?
  - Lecture on the background and theory
  - Demonstration of existing solutions and ideas
  - Peer and Mentor free-flow discussion
  - Hands-On problem solving with peers and mentors after reading required material on free time?
- So far in the OMSCS program, how do you best absorb new class material?
  - Multitask while learning new content (i.e. drive, workout, chores while watching lectures)
  - Dedicate spare time to absorbing new lecture material
  - Write meticulous notes since video lectures do nothing for me.
  - Do external research on all new topics covered in class
- If you were asked to participate in a class using experimental teaching aids, which would you most likely attend?
  - Class taught by renowned professor
  - Class taught by industry professional
  - Class taught by my peers, but with knowledge of the topic.
  - Class taught by high-school kids which were taught the subject and assessed to be well versed in what is needed to teach it to others.

The Survey – Study Material

- Is the origin of study material important to you? I.e. it came from a class in Stanford/MIT or original work from your professor?
  - Not important
  - must be from reputable institution
  - must be from reputable professor
  - must be my professors original work.
- Do you prefer knowledge that:
  - provides a deep understanding of specific fundamental principles
  - broad knowledge of surface level features causes and effects
  - hands on knowledge which can be applied to everyday life
  - no preference whatever the professor decides is what I need to know?
- What kind of study material best allows you to retain knowledge?
  - Running a laboratory experiment
  - Solving a cognitive problem
  - Listening to a lecture
  - Reading supporting material in depth or breadth.

The Survey – Content Delivery

- What method of knowledge delivery best facilitates knowledge retention for you?
  - In person lectures
  - video recorded lectures
  - written lecture material
  - books and articles,
- Do you find that all knowledge you desire to know is easily accessible, attainable, and is presented in a way that is retainable in your mind for long periods of time?
  - Absolutely
  - Somewhat
  - Adequate
  - Not really
  - Not at all.
- If you could pick a futuristic technology to use for learning new material, which would you like?
  - VR enabled studies where you can exist as the phenomenon you are studying manipulate nanoscale worlds and be waves, particles, and photons in different universes,
  - Embedded brain electronics which can download all information from the net instantaneously.
  - Quantum AI which will know all answers to all universe's questions and you can just ask it anything.
  - I like the way things are as is.

The Survey – Quantum Computing

- Which topics sound interesting to you?
  - Parallel universes,
  - Superposition,
  - Time Travel,
  - Teleportation,
  - Quantum Mechanics,
  - Mathematics of Quantum Error Correction,
  - Applications of Quantum Computing.
- In what scenario would you choose to take a Quantum Computing class?
  - Only if Dr. Joyner will be teaching it,
  - Only if a famous professor or a famous University is teaching it,
  - Only if it advances my career,
  - Only if the topics and material interest me.
- If you had access to a Quantum Computer, what would you do with it?
  - Sell it on eBay,
  - use it for home projects (i.e. Quantum controlled fish feeder)
  - learn all I can about it and use it at work to advance my career.
  - Figure out how to use it to make myself rich.
- If Georgia Tech was offering a $5000 Master's in Quantum Computing degree, would you sign up?
  - Take my money right now,
  - depends on the classes,
  - depends on the need for this at my work,
  - depends on my other priorities such as family, social life, etc.

Next Steps

- Refine the Survey
- Re-write the survey
- Bring back focus on Quantum Computing

Video Link

- https://youtu.be/GsONiQtwBGs