Good evening,

THIS is not a chapel talk.  This is not the chapel; this is not me at the pulpit in front of the chapel speaking to all of you.  I do not normally enjoy public speaking and giving a chapel talk would be entirely too frightening.

Instead, we are all sitting in the dining room at a family style meal.

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We are conversing, sharing stories and jokes, and the topic shifts to what each of us might talk about if asked to give a chapel talk.  And being the type of person who wouldn't normally volunteer for public speaking, I don't have any ideas.  Someone suggests a chapel talk should answer the following question:

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Why do you like doing the things that you do at St. Andrew's.

At first, I sort of feel like this is the type of question that is posted on those colorful pieces of paper in the stairwells and on classroom walls:  Questions like

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"What place do you most want to protect?"

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or  "Why are jet skis not called boater-cycles?"

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But the more I think about the question - why do I like doing the things that I do - the answer is harder than that.

First, I guess I should think a bit about what I do.  At the top of that list is teaching computer science.

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And to talk about computer science, I first need to explain something about computer science.  It's kind of a bad name.

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What I and my students do in class is not really a science - not in the sense that science is the pursuit of a deeper understanding and better model of the natural world through systematic observation.  Science is awesome and neat and fun and powerful, but not really what we do in class.  And the computer part isn't quite accurate either. Sure, we use computers in class, but they are a tool for the learning, not the object of it.  Calling our class computer science would be like referring to the experience of the drawing program as "pencil science" or getting a good workout in the weight room and calling it "bench-press art".  So what is it then?  What do we do in class and what should we call it?

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At the core, the lessons in class are about problem solving.  Here is a challenge, a task, and here is a toolkit, how can we accomplish the task using the tools and the bits

and the things we have available.  Most of the time, we develop this skill using a computer programming language, but not always.  And this is a repetitive process - we never succeed on the first attempt, we try, we fail, we rework, and we try again.  More importantly, the muscle in our brains that we are developing to solve these problems is strong and flexible -

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The training it receives by designing computer programs also trains it to be ready for solving problems in other places in our lives.  And like nearly all things, the more we practice this skill, the more we train this ability, the better we get at it.  So, in a sense, the class is really about preparation for life - about planning the way you think about a task or a challenge and developing a solution.

And beyond that, practicing this skill provides confidence - that sense that this task is accomplishable.  A belief that this task is not difficult since I know what to do, how to approach it, and how to solve it.  And like that problem-solving brain muscle, the construction of faith in our ability to achieve, of self-confidence in our capability to find a solution, is a mental trait that certainly transcends the framework of computer programming and can help in all that we do -- in the classroom, on the fields, in the recital hall, or playing a role on stage in front of an audience.  The things we learn and do and practice in class prepare us for the chance for success everywhere.

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And so what name should we use for this if not Computer Science?  I'm open to ideas. I'm leaning toward "Design Thinking in Problem Solving" which more accurately

describes the goal of the course but is a little obtuse.  Maybe "Brain boot camp" would be better.  When you're filling out your course sign up sheets in the next few weeks,
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perhaps you can write down your idea for a new name when you sign up.

I also work in the St. Andrew's Technology Department.
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Every day in this role, I get to solve puzzles.  It's addicting.  I'm one of those types of people who wakes up on a rainy day and reaches for a jigsaw puzzle box - and then 6 hours have gone by while I work the puzzle.  I can't walk away from it.  Working in the technology department is sometimes similar.
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When I was younger, I would read these 3-inch thick computer manuals.  They were not the most entertaining literature, but they provided insight and explanation for how the things in a computer worked and how I could use those things better.  Learning about how computers and technology worked helped me improve at solving those puzzles.  When my family purchased our first computer - and back then, owning your own computer was a big deal - one of the first things I did was open it up.

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I was too scared to touch anything inside of the case, but I wanted to see what all the parts looked like - even if I didn't then know what they were.  As time went by and I learned more about computers and how they work, I was no longer scared of touching the parts within - and I started building my own computers, so I could see how the individual parts came together to make a functional device.

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At St Andrew's, the computer and technological systems used by the school are similar -- many independent parts working together. Keeping them all running always requires attention and care. When something doesn't work quite right and needs to be figured out - it is a puzzle to solve. Rarely is the answer immediately clear; diagnosing computer problems requires time, effort, and thought. But just like with problem solving in my classes, fixing those computer issues, maintaining the technology systems of the school, and assisting those that use those systems is a skill, an ability, that improves with practice. Working on solutions for all of those technological puzzles each day makes me better at solving the next one.

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One other thing that I do at St. Andrew's is work in the Makerspace. There is something satisfying about building something you can hold -- not just a design on paper or a program in a computer, but a real, physical, tangible object that you can hold in your hand. That operates. That interacts. I really don't know why the physicality matters - and I don't want to discount the value of theoretical ideas, concepts, or works that don't have a physical presence, but there is a different quality to something that you can hold in your hand and point at it and say, "That. There. I made it." Returning from sabbatical, I was excited to see the St. Andrew's Makerspace which contained all of the tools and resources available for the topics, techniques, and lessons related to STEM education that I had been reading about and researching. And the most exciting thing is that I am not a master of many of those tools. Every time I enter the Makerspace, I get a chance to learn something new, to build something that can help me learn how to use a new tool. Mr. Sargeni has been teaching me a lot about the laser cutter - and I hope you all have seen the Kylo Ren lightsaber that Mr. Lewis built using the 3D printer in the Makerspace - and the laser cut stand that Mr. Sargeni designed for it. And I have been sharing with Mr Sargeni some of my projects involving electronics - where most of my experience with making things has been so far. Working with electronics is neat for me because it moves my work with computer

programming out of the computer and in to something physical.  Something real.  Sometimes it is something silly and fun like these sunglasses I built for a Halloween costume.

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Sometimes my electronics projects can be something practical and useful.  This is a sensor I built and programmed that uses a $2 arduino microcontroller.
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That is the same type of electronic device from Mr. Bhatia's video from school meeting last week about making a paper piano.  My sensor collects data about the temperature, humidity, light level, and motion in the various rooms of my house in Lewes, Delaware and sends the data to this $35 mini computer called a Raspberry Pi.

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This tiny computer collects the data and presents it on a webpage that I can use to make sure everything is ok at the house when I'm away.

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And that computer can respond to the data as well.  If the heating system breaks and temperatures in the house drop which might cause a pipe to burst?  I get a text message before it happens.  If motion is detected in the kitchen when no one is supposed to be home?  All the lights in the house start flashing and that little computer calls my cell phone to let me know of the problem.

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Very soon, I'd like to start a student-run project to build a comparable system for logging similar data in our classrooms to understand the energy usage in our spaces on campus - all of it designed, tested, and built in our own Makerspace.  Come chat with me if you'd like to be a part of that project.

So flashback to the beginning --
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we're all in the dining hall thinking about a chapel talk idea based on a question:

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Why do you like doing the things you do at St. Andrew's?

But maybe that isn't a question at all but a puzzle to be solved.  And maybe the answer to that question isn't a speech in public but is something else, something like I described earlier, something that I can design, that I can make, that I can troubleshoot, that I can break and fix, that I can improve, that I can build, and that I can share. That's a process I know and one that I've practiced and trained for - a muscle in my brain that I know how to use.  And since those are all concepts and methods and techniques that I understand and have done before, I can feel confident in my ability to do it, to make it happen.  So, maybe this isn't really a chat we are having in the dining hall, maybe, by imaging the process as something I am familiar with, by envisioning the steps in terms of skills that I've practiced, the response to that question could be crafted and built into an answer in the form of a speech, to be spoken in front of a congregation, at a pulpit, in a chapel, as a chapel talk.

Maybe.