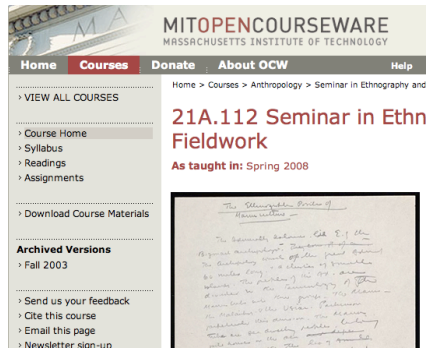


in the workplace  
Online Learning

## In the workplace

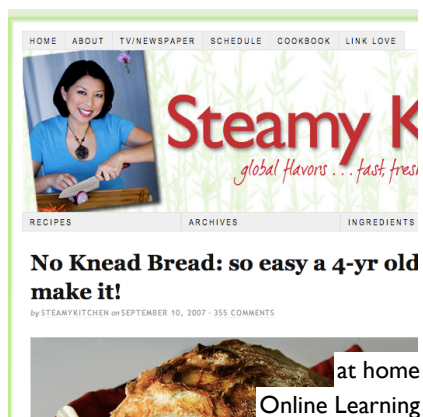
The biggest growth in online learning is occurring in offices and factories and laboratories across the globe, as corporations move their training and development programs from the classroom to the computer. Companies such as Cisco Systems have developed a university-sized array of online courses and updates for its employees, which they are expected to draw on to learn new things.



at the university  
Online Learning

## On campus

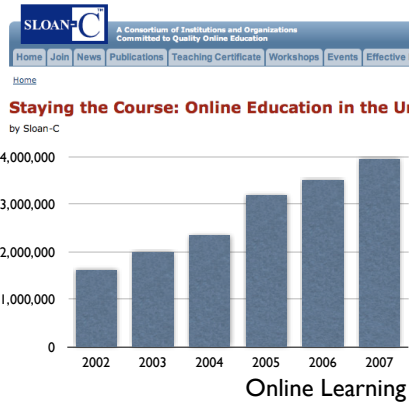
The number of college students taking their coursework online rather than in the classroom has doubled in the last five years. From Stanford to Yale to Duke to Rappahannock Community College and MIT, professors are learning to teach, and students are learning to learn in a new environment that's quite different from the lecture hall.



at home  
Online Learning

## At home

Baking the bread for the evening meal became my responsibility one day. I had not a clue how to do it. So I went online and found a course Bread-Baking for Four-Year-Olds. In words and pictures, it led me through the process of mixing the dry ingredients, adding the water, rising, rising again, and baking. And they liked it! The proof is in the pudding, you might say.



So it's all around us, and growing quickly, as the internet reaches more desktops and laptops and iPhones with multimedia materials and illuminating lessons. A recent report by the Sloane Foundation documents this growth, who's leading it, and the reasons for it.



Why?

Why this tremendous growth in online learning in so short a time? We can find several reasons.

More opportunities to learn

Even though my school is not large enough to offer Calculus or Chinese or Computer Science, I can take these courses anyway and get credit for them by studying online. An online connection allows me to learn with an expert in Alberta or with my fellow-students in Albania, without leaving the classroom.

What is a Coral?  
Ofu Island  
American Samoa

**Molecular Evolution of a Portion of the Mitochondrial 16S Ribosomal Gene Region in Scleractinian Corals**  
Sandra L. Romano,\* Stephen R. Palumbi  
Department of Zoology and Kerstin Martin Lab, University of Hawaii, Honolulu, HI 96822, USA  
Received 6 September 1998; Accepted 7 April 1999

**Abstract.** Relationships among families and suborders of scleractinian corals are poorly understood. Because of difficulties in making inferences about the evolution of the morphological characters used in coral taxonomy and in interpreting their 240 million year fossil records, here we describe patterns of molecular evolution in a segment of the mitochondrial (mt) 16S ribosomal gene from a set of 14 families of corals and the use of this gene segment in a phylogenetic analysis of scleractinians within the order. We show that sequences obtained from mitochondrial DNA from 14 coral families, the ribosomal sequence and 16S mtDNA (which is coded directly by one of the organelle gene products) compare

**Key words:** Scleractinia – Mitochondrial 16S ribosomal DNA – Secondary structure models – Phylogenetic analysis

**Introduction**  
The phylum Cnidaria is a group of all organisms that diverged from the base of the tree. In addition to morphological characters long been used to infer an accurate cladistic molecular research on scleractinians.

styles of learning  
Online Learning

## More learning styles

People learn in different ways. Sometimes I learn best by reading the text, skimming for the main idea or working slowly through a dense argument. At other times (like when I am driving the car) I learn best while listening to someone explain it to me in a calm and patient voice. And there are some concepts, especially in science, that I can learn only if I can see them in action. Online learning allows me to choose which method is best for me.



## More learning modes

Sometimes I learn best all by myself. At other times I need to bounce my ideas off a small group of trusted peers. And some ideas are best learned in a large group where we're all online and can help each other work our way through the material. Online courses let me choose the mode that's best for me.



## Self-paced

Sometimes, when I'm in a state of flow, I plow right through the subject, learning deeply and quickly whatever is put in front of me. At other times I need to work slowly, going back and forth over the same idea many times before I get it. Online courses let me learn at my own pace.

Who is buried in Grant's Tomb?

- a. Abraham Lincoln
- b. Gen. Ulysses S. Grant
- c. Cary Grant
- d. Mayor Bloomberg

self-correcting  
Online Learning

## Self-correcting

After studying for a while, I like to test myself to see if I've learned anything. Online courses often include frequent self-correcting quizzes that let me assess my progress, and even guide me along when I get the wrong answer. This is much more effective than waiting for the midterm to see if I'm learning anything.

Who is buried in Grant's Tomb?

- a. Abraham Lincoln
- b. Gen. Ulysses S. Grant
- c. Cary Grant
- d. Mayor Bloomberg

Cary Grant was a movie star of the 1940's and 50's who died in 1986. He is not buried in Grant's Tomb. Try again.

self-correcting  
Online Learning

Who is buried in Grant's Tomb?

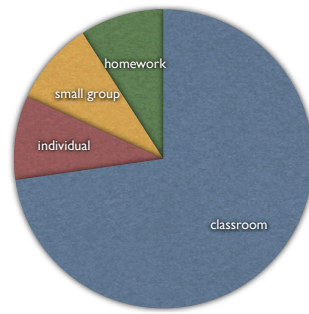
- a. Abraham Lincoln
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Ulysses S. Grant led Union army forces to victory in the Civil War. He is buried in Grant's Tomb in New York.

cross-references  
self-correcting  
Online Learning

## Cross-referenced

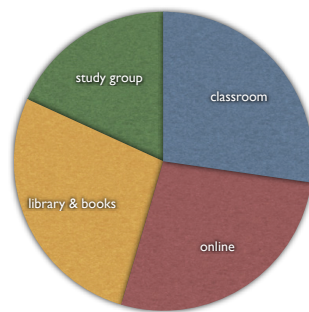
When I'm in the classroom, it's hard to delve deeper or check out alternative views. But online I am connected to a world-wide web of cross-references, details, original sources, illustrations and examples that range far beyond what's available in the school library. So my learning can be enriched by a wide array of resources.



When I went to school...

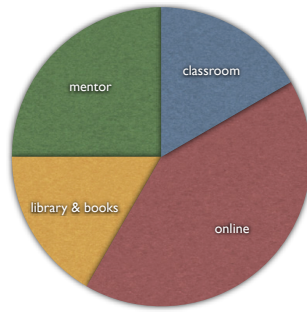
When I went to school...

...most of the time we sat in class, led by the teacher. Once in a while we did independent research in the library, and a few minutes of homework in the evening. Nonetheless, the bulk of the time was spent sitting and listening.



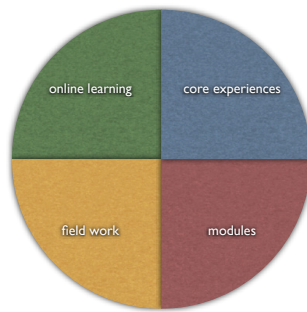
Today in college

But the world has changed. In the workplace today, people spend very little time sitting and listening. They are online communicating with their customers, or taking an online course to improve themselves, or working with a small group of co-workers to solve a problem. If we want school to prepare people for this new workplace, we need to better match the learning modes to the real world.



Today in the workplace

And if we want school to prepare our students for college, we need to understand that college students spend only about 12 hours a week in a classroom -- about 15% of their waking hours. The rest is spent learning online, or working independently in the library, or studying with fellow-students. The more that high schools can match this style, the better prepared they'll be for college.



Today at the iSchool





Does it work?

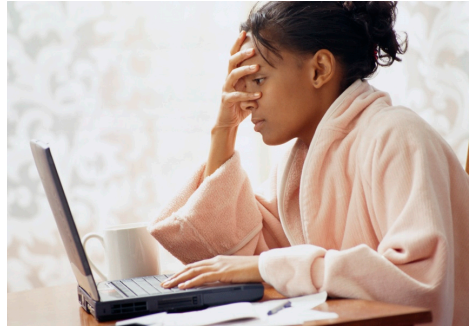
Not for everybody. While online learning has enabled millions of people to excel who are not good classroom learners, a few folks are frustrated. They can't seem to concentrate on what they need to do unless someone is right there giving them directions. People who have succeeded online say that the experience helped them build self-reliance and self-confidence: they were better able to figure things out for themselves.



Results  
Online Learning

Does it work?

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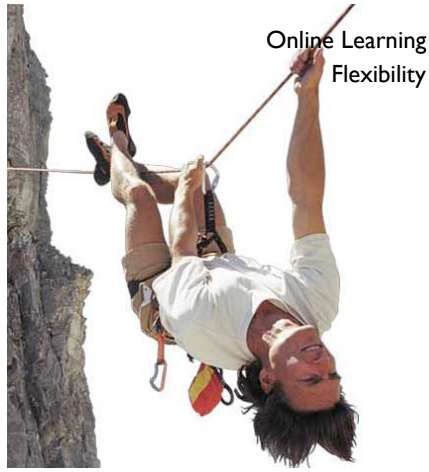
Results  
Online Learning

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Self-reliance  
Online Learning

Others extol the flexibility of online learning, letting them study whenever and wherever they want, moving as slowly or as quickly as they need to, and assessing their own progress. All agree that the online approach helped them develop time-management skills, the ability to discipline yourself to set time aside to get up and do what needs to be done.



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Time management  
Online Learning

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Student vs. Learner  
Online Learning

They explain that they have taken over their own learning plan -- they don't wait for someone to tell them what do learn and when, and they don't learn merely to please the teacher -- the learn to improve themselves. This can only help them in their future lives.



Learning Environment  
Conditions for Success  
Online Learning

Conditions for success

How can we set things up so that we succeed at learning online?

First of all, we need to work in an environment that makes it easy to work online. A good computer with a solid internet connection is essential. It helps to have people nearby who can assist you through the tough parts.

What we need to remove from this environment is the television. This ubiquitous appliance is anathema to learning. It cries for attention, it flashes visual drivel designed to interrupt your train of thought, and has proven itself to be a detriment to academic achievement. Turn it off. Better yet, put it in the closet.

Music is another matter. Certain types of music have been shown to provide a calming background for study that drowns out the interruptions of the world around us and enables us to concentrate on our learning. Music without lyrics works best. For me, the predictable repetitions of Bach or the soft strings of Sibelius help me get my work done.



Time Management  
Conditions for Success  
Online Learning

## Conditions for success

How can we set things up so that we succeed at learning online?

No matter where I am or what I am listening to, it's time that matters. Time is of the essence. Unless I learn to manage my own time, I will not succeed at online learning (or anything else important in this world.) At birth we are granted by our creator three score and ten years; it's how we spend that gift that determines our worth and our success. Set a time for learning, start promptly, and stick to it until the task is complete.



Reflection  
Conditions for Success  
Online Learning

Finally, when you've worked through a set of online materials, find someone to talk with about what you have learned. A parent, a spouse, a good friend, or a fellow student can help you reflect on what you have uncovered. This consolidates your learning and puts it into a social context.



Oops, there's the bell over timer. I must stop writing and check the loaf of online-learned bread...