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Do We Need Universities Anymore?

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With the recent pandemic, all of us university professors got scant notice and instruction on how we would move from in-person teaching to fully online. At the University of Southern California (USC), we were told on a Friday that on Monday we were all Zooming—Zoom turned out to be a piece of crap software as the company was too broke to hire a user interface specialist to make sure that its user interface was comprehendible by mere professors. Those of us teaching game development somehow survived and started questioning whether there was much future for universities seeing that we could do almost everything online in a virtual space. The purpose of this article is to kind of review how we teach in

person and throw out some straw dogs on what our potential future could be if maintaining a large real estate portfolio, the university land and its buildings, was not the driving force.

HOW WE TEACH NOW

Figure 1 is a high-level look at how we now teach with the professor in the classroom in the postpandemic, Zoom-forever era. The professor is at

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the front of the room with PowerPoint slides and trying to share them on the classroom projector at the same time as he/she is sharing those slides via Zoom to students that have not made it to class for some reason or other. This turns out to be a juggling match for the professor. There are projector technical issues—does Zoom have the right laptop/desktop feed out to the projector—there is a complicated interface for that, and the defaults aren't the right settings? Is the projector bright enough or do we have to turn off the room lights completely so we cannot see which students are sleeping

nor can we ever learn the name of the ones awake enough? We don't have an in-room audio-visual (AV) support person to help us with this—we can call one and they show up in ten minutes and maybe take ten minutes more to get everything going. We have professor focus issues—when you are juggling all the AV yourself, it is hard to also maintain focus on presenting the course material. It's just a fact— the mind is splitting its cycles. And my most favorite Zoom issue is the Share Sound and Optimize for Video Clip checkboxes that no one sees when they go to share their weekly progress report video. Why is the default not to automatically share sound? Why can't Zoom detect when a video is being shared? Mysteries for which there are no answers.

Our live labs with teaching assistants (TAs) go as always but again some students might just decide to hang at home instead and be on Zoom and that doesn't work well for evaluating team progress. Everyone
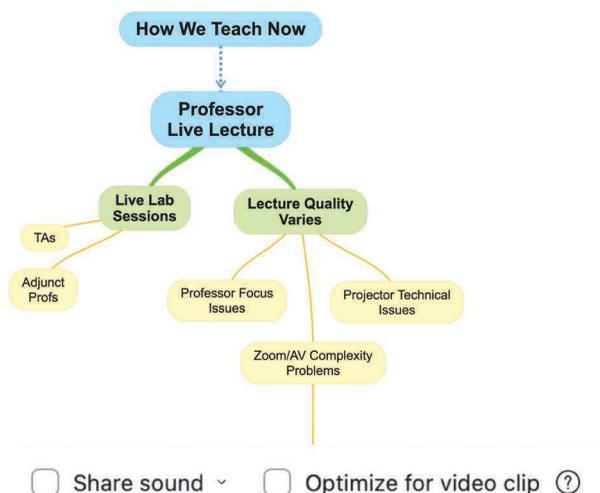
ought to be there. On Zoom, our students all turn their cameras off and they have conveniently signed up on Zoom with just their two initials instead of their name so we never learn their names.

So when we teach students game development in the Zoom-forever era, there are challenges.

COURSERA AND OTHER MOOCs

Before the pandemic, we had many companies creating what are known as MOOCs, massive open online courses. I am going to pick on Coursera as it is either the largest MOOC or one of the most successful and it is just for illustration. What I have discovered is that many of my students at USC have taken MOOC courses in preparation for courses at USC. One of the Coursera courses most often taken by my students is Andrew Ng's Machine Learning for Beginners class. Students that have taken that class perform the best in my Applied Machine Learning for Games class—they perform better than students that have taken the graduate course on machine learning at USC, for the most part. So, what is Coursera? (See Figure 2.)

With Coursera, each lecture is prerecorded, which means that there can be considerable quality control and perfect focus on the course material. So, an outstanding teacher can record his/her lectures and not be bound by the machinations of also having to focus on getting Zoom working, which is a huge win. The downside is that the lecturer on Coursera could be anyone and the technical quality of the recorded video could vary, as they say. So, recording quality could vary in terms of recorded image and recorded audio. Since the lectures are prerecorded, they can be watched at any time asynchronously. Coursera has made its recorded lectures open and free to anyone who wishes to audit their courses. Class support leading to a class or specialization certificate is rightly behind a paywall. So,

FIGURE 1. How we teach now.

homework and assignments, online quizzes/exams, and student forums are there for the paying student. So, a MOOC like Coursera is one part of the future of education. One of the benefits of a commercial MOOC is that new courses can be built and put online quickly. New courses at a university like USC could easily take 1½ years to be approved and put onto the teaching schedule.

HOW WE COULD TEACH

Figure 3 shows us a look at how we could teach. This is, of course, derived from MOOCs. We do professionally recorded master classes and find the best person in the world to teach that particular material. Instead of a random faculty member at your university teaching the class, we reach out to a superstar and pay them to record the lectures with a professional recording staff. Well-produced sound and perfect image are the result. The industry professional we have record the class gets paid for his/her time during recording and a royalty stream as long as the recordings continue to be used in our online school. The recorded lectures can be used asynchronously or synchronously and protected from piracy. We kind of also get this idea from the Masterclass series of videos but frankly most of the Masterclass videos I have watched have been terribly produced and done without any focus on quality—an example is the Jodie Foster Masterclass where the game we have is to count how many times she says "ummm" in any given sentence. We can make this high quality and highly scalable with the right performer.

With respect to lab sessions, we can still have live paid TAs and maybe even TAs with more commercial experience. We can also review team projects fully online as we did during the pandemic if we wish to reach beyond our local area. We can also look at team weekly progress videos asynchronously with comments delivered in a dedicated slack channel for each team.

Honestly, with this architecture we could create a global university with local studios for in-person project reviews almost anywhere. We might call this Global Artists – Los Angeles and then have Seoul and Dubai studios as well or any other part of the world interested in creating a local game development industry.

THE INVISIBLE SCHOOL

I started this article to focus on how we could teach better with respect to game development than we are doing now in this Zoom-forever era. If we are successful, then we can replace most of what happens currently in universities. Replacing universities or entire school systems is happening globally. One project
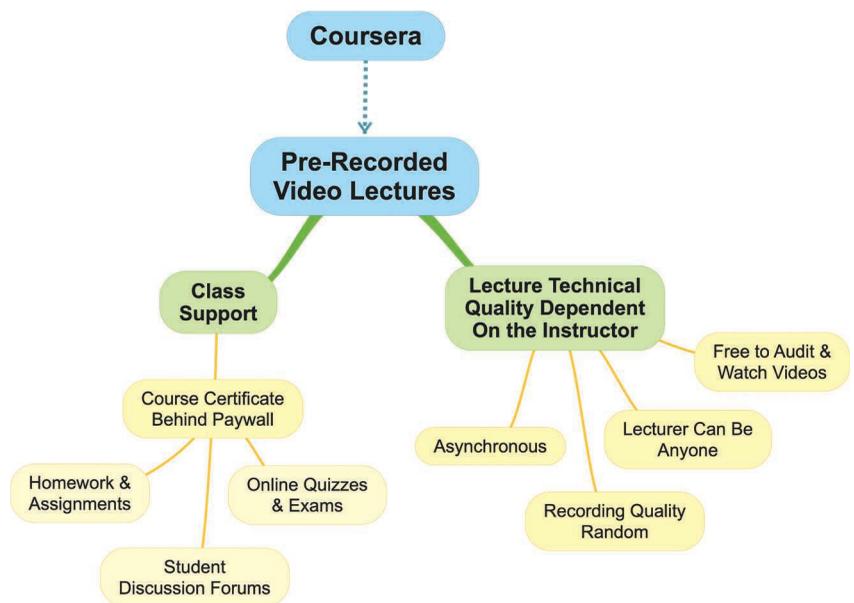

FIGURE 2. Approximate block diagram of Coursera.
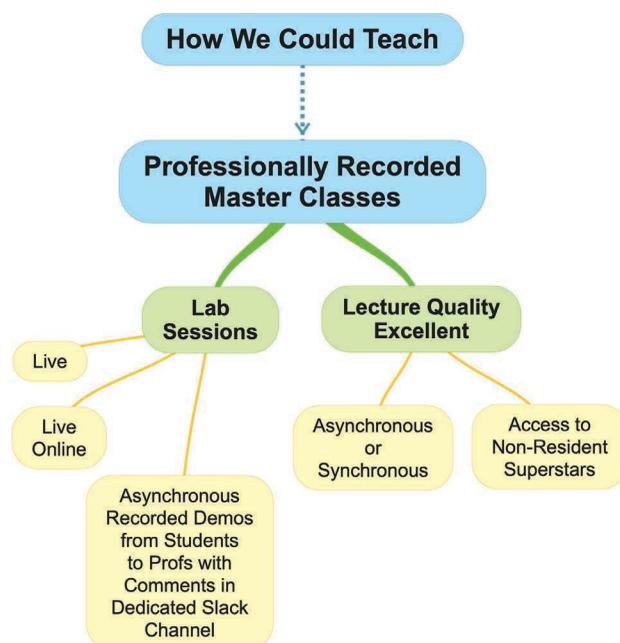

FIGURE 3. How we could teach.

that I know well is happening in China and it is called The Invisible School (Figure 4). This project was started by three Ph.D. degree students that dropped out of the University of California, Los Angeles and asked me to be the CTO for their startup. I said yes, and they told me they would come back to me in six months with the plan for that startup, and this brief coverage of that project is the current state of what they are working on. The three students went back to China when their visas required them to do so.

The Invisible School has the tenant principle of no live lectures, again the idea that live lectures don't scale or bode well for the students in the parts of China not near large metropolitan areas. Now, The Invisible School is focusing on K–12 but can easily be extended to university education.

The top level of The Invisible School is a machine learning system for evaluating students to find out what they need to learn. We started by feeding the machine learning system a detailed survey of some 10,000 digital games built for educational purpose. We were trying to be able to make recommendations from the machine learning system to the students as to what digital game they should play to learn the next knowledge. We added in digital educational artifacts for the holes not covered in games, and we are looking at producing professionally produced master classes into that mix as well. So, the purpose of the machine learning system is to point the

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COMMENTS?

If you have comments about this article, or topics or references I should have cited or you want to rant back to me on why what I say is nonsense, I want to hear. Every time we finish one of these columns, and it goes to print, what I'm going to do is get it up online and maybe point to it at my Facebook (mikezyda) and my LinkedIn (mikezyda) pages so that I can receive comments from you. Maybe we'll react to some of those comments in future columns or online to enlighten you in real time! This is the "Games" column. You have a wonderful day.
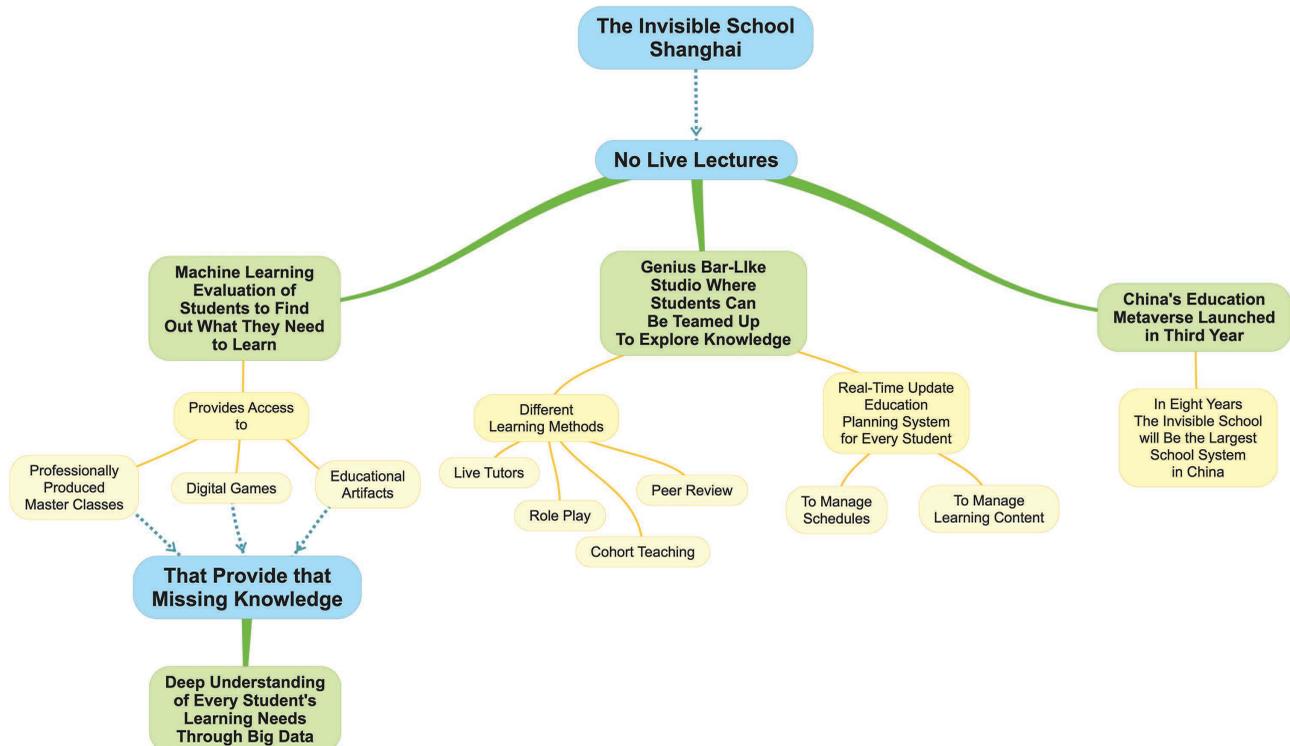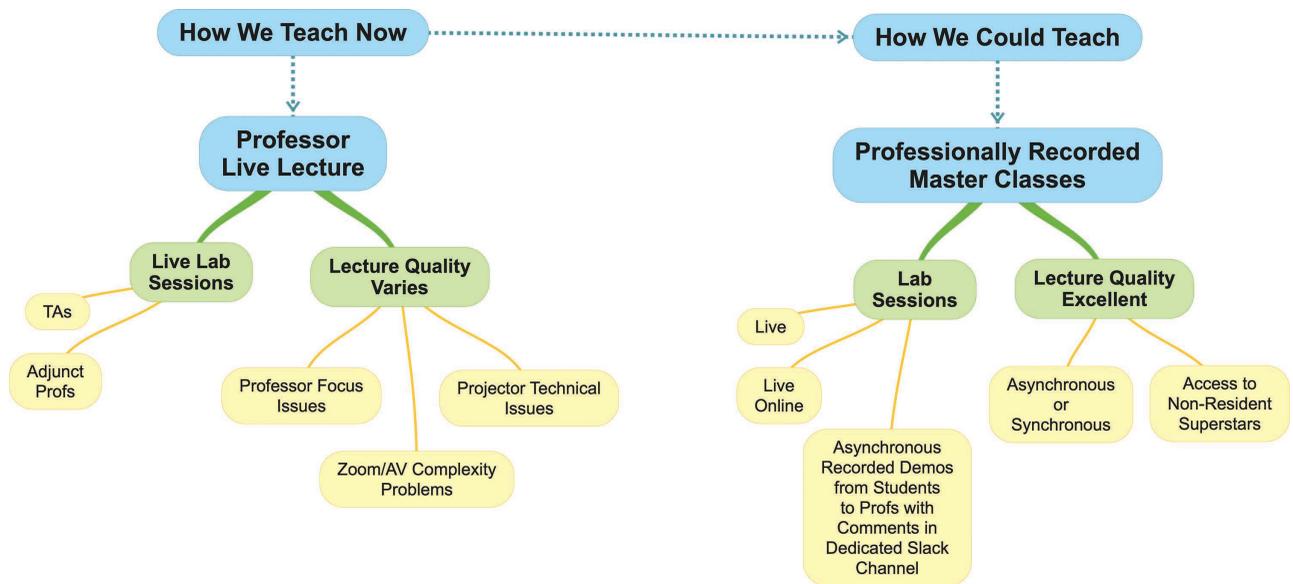

FIGURE 4. The Invisible School.

FIGURE 5. How we teach now and how we could teach.

students to what they next need to learn. The end result will be a deep understanding of every student's learning needs through the use of big data.

The goal is to build an Apple Store-like presence in China, with a store in every city and town. There will be a Genius Bar-like studio where students can be teamed up to explore knowledge—think of student cohort groups. There will be live tutors to help with the hard stuff. There will be role play and cohort teaching—we will teach the students how to teach each other. There will be peer review systems in place to make sure everyone is learning. There will be a real-time update education planning system for every student to manage the learning content they require and to manage the schedule on which they need to learn.

In the third year of the project, China's Education Metaverse will be launched and integrated into The Invisible School. If all goes well (funding, development, deployment) in eight years, The Invisible School will be the largest school system in China.

This is a huge effort, and the initial funding has been obtained. We will see. The most important thing to note is this is a proposed big change in how

K–12 education is delivered in the most populous country in the world. If successful, this impact will be global.

HOW DO WE TEACH NOW AND HOW WE COULD TEACH

We started by pointing out how we teach now and trying to say that we feel it is less than optimal in terms of student learning (Figure 5). Additionally, there is a huge teacher shortage (Figure 6).[2] Our students can learn in the old way, *but* people are now thinking about how it could be different and how the architecture of how we teach could be fixed if we can get past the big real estate question. My six-year-old granddaughter looks at the world and asks questions like "how do you make donuts?" and "how do we change the oil on the truck?" and my son finds her the right YouTube video to learn the answer to her questions. She now can find things on her own as she can speak searches into her iPad just like in the Diamond Age.[1] So, the architecture of education is changing, and people are trying out all kinds of different things to educate themselves. And in the end, we will all be better off as the demand for knowledge pushes past the demand for an ever-larger college campus.

FIGURE 6. Washington Post 19 January 2023.

500 teachers in presence. My talk at that time was "how can we replace all teachers with educational games?". The teachers did not "boo my presentation" and they expected to be replaced, is what they told me. I met Brock Dubbels there, and he is one of the best analytical minds on thinking about the future of education. Liu Fengyuan is the CEO of The Invisible School project and the funding for that project comes from the Yalong Group, Shanghai. We bless everyone trying to create new learning architectures and the path they take there! ▣

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REFERENCES

1. "A teacher shortage so acute that students are expected to learn without one: In rural Mississippi, the geometry teacher is a recording. The chemistry students often teach themselves. Rural and Southern states face a crisis," *Washington Post*, Jan. 19, 2023. [Online]. Available: https://www.washingtonpost.com/education/2023/01/19/teacher-shortage-mississippi/

2. N. Stephenson, *The Diamond Age: Or, a Young Lady's Illustrated Primer*. New York, NY, USA: Random House, 1995.