Panel 4:

Moderator Joyce Feucht-Haviar: I'm Joyce Feucht-Haviar; I'm the dean of the Tseng College here at California State University, Northridge. I'm going to be facilitating -- which mostly means I'm going to sit and listen while these other good people are going to talk. We're going to try to take five to ten minutes each per panelist to give some stimulus remarks. Then we're going to have an open conversation. We will have the stimulus presentation in the order in which our panelists are sitting. You each have the handout with the bios for each panelist so we don't have to spend time on those preliminaries. And you match the name on the bio with the person on the panel (and they come with convenient name signs in front of them).

[Laughter] Okay, stop that. Okay ready set you.

Gerry Hanley: Well first, thank you very much Joyce and thank you all for showing up on a Friday afternoon to talk about technology for 50 years from now. And let me just begin with the, a point that Jolene made about dialogue. I think it's essential, especially when we do planning. And, dialogue is about surrendering your own perspective so you have a chance to understand and embrace someone else's. And, I think, when you think about 50 years from now and what us three panelists are going to say, you're going to say what the heck is Jerry drinking or smoking or whatever like that. How could he ever think about that? And, I think part of the fun of thinking about the future is well let's surrender my opinions for a moment so I can have an understanding and then, really then do a good critical analysis of it. So, so that's just some opening comments there.

So, I'll break my comments into a few topic areas, one about the future. We've all heard about learning by doing. I think the future is going to be doing by learning. And what that means is that whenever I have to do anything, when I'm four years old and I have to, we were talking at lunch time, when I'm excited about what color the sky is or I have to mow the grass and why am I getting green grass stains. Why is grass green? How can I, in a sense, take that experience when I'm doing something and learn what I need at that time in that context for me to do it better? And, I think one of the things that that's going to allow is that my life is going to be very rich across many disciplines. When I'm trying to fix a faucet in my bathroom, I suddenly have to become an engineer. And, imagine my ability to bring up information to learn, while I'm doing it, and after I fix a few faucets, maybe I can get a little certificate in a sense that can be part of my portfolio of I now know a little bit about mechanical engineering, right.

So, embedding that learning into my doing. And, I think that's going to help make sure that my life really crosses multiple disciplines. That there are times in my leisure and I want to know the history when I'm on vacation so I can learn while I'm doing my life there. And the other aspect that I thinks' going to be important in this by learning aspects, in 50 years from now it'll be about the 100th year anniversary for a very important book by Oric Naser. Anybody know what that book is? Any cognitive psychologists in this room? Well, in 1967 Oric Naser wrote the first book called cognitive psychology. And, I think in order for us to do by learning, we, in a sense, have to learn to understand how this tool works. In a sense, we have to know what leads to my good learning. In a sense there are, there are there's knowledge in our discipline in cognitive psychologist as being one. I try to advocate. We all need to know what enables me to learn more successfully. What enables me to remember something? What enables me to solve a problem more effectively? What enables me to transfer what I've learned in one situation to another?

And there is a science, there is a discipline that can help us learn how to learn more efficiently because that is going to be what we're going to need all the time. Change is going to occur and we're going to have to learn how to learn and we're going to have to do by learning.

The second thing, I think, in the future is going to be about personalization of our learning process both in advising and instruction. And, you know how we have GPS right now. I know where I am and I say I want to go someplace else and it gives me personal advice right. Okay, now, think about the graduation positioning system, right, right. In a sense, I'm trying to achieve some learning outcome, I'm trying to graduate. But I need to know where am I in my coursework? Where am I in my learning? What do I know? If I have to learn, I'm going into business and I need business stat, and it knows Jerry, you know, you did pretty lousy in algebra II, your quadratic equation support, you need to bone up on that first before I can really be successful here.

Understanding the personal needs of the learner and how technology actually, by doing a constant assessment of where I am, and that's why I think assessment is so important in a learning process, it makes accountable my learning process. If I don't know where I am, how can a GPS system tell you where to go if you don't know where you are, right? And, that learning situation is rather unique to each person. And, that's what makes our job so difficult as teachers is our students come in with all different kind of where they are in their learning process. And, I think, technology through continuous assessment of what we know and don't know, can help us as teachers find the ways of what that person needs more effectively. And the personalization applies to the diversity of people who are coming to our classes, people with disabilities. The personalization is how am I going to deliver that content so the blind student can have an effective learning experience? How about the Hispanic whose family may not have had a long term relationship with educational processes. What do they need? And there's all the different what makes us different then becomes part of the educational process.

Okay, the next element here is around access to augmented reality for all, okay. and, in part, we all have our, many people have our, your smart phones and someone says who, if I say who's Oric Naser, right, before technology you'd say gee I have to go to the library and I have to, you know, ask someone who knows, right. But now, you can whip out your smart phone, type in Oric Nisar on Wikipedia, and guess what, there's his picture, it tells you all his books, da, da, da right there right.

Now, in a sense, that is augmenting reality. You are bringing technology, you are bringing information to the point where you are really existing. Now, imagine that, instead of having to bring the device, you have a chance to say I wonder how this works, right. In a sense, if my glasses now, a litter terminator type thing, would in sense, would project how all the electricity flows. Or if I have to fix it I have to put a new bottom on, well, how does it work? In a sense, you can project the structure of this and it can help me become an engineer without ever having an engineering degree in a sense. So, the augmentation, the projection of all this multimedia into the context in which I am learning, I think that's what technology can help too. And then, it also ties into I can now do things because augmented reality will let me learn it.

And then, the final thing I'll say is no more four more years, all right. I think, when we look at what constitutes our, in a sense, the credentials of what we know, I think, what we're going to need to know is going to be more a portfolio of competencies that are demonstrated through our demonstrated skills in the achievement of learning outcomes that are represented in a portfolio that actually has been reviewed and accredited. Education is still going to be essential in the quality

assurance of the skills and knowledge of the learning process. But, I think, it's not going to be here's a baccalaureate. Or, there may be one how a collection of credentials lets you achieve a certain level, but, I think it's going to be much more a portfolio strategy. So, I'll stop there at kind of the four things that I think, 50 years from now our world will be a little different.

Moderator Feucht-Haviar: and I was hoping for the "beam up" technology to be developed really soon.

[Laughter].

Moderator Feucht-Haviar: Next.

Terri Yamada: Thank you. I think this is on. I'm sorry I have a cold so if I start coughing, I apologize in advance. My comments are a little bit different. They have to do with the period of what appears to be dramatic change that we now find ourselves in and the process that we might want to engage in and think about as we go through this period of change.

First, I'd like to thank the CSUN organizers for their gracious invitation to me and we've had a delightful lunch conversation. So, it's been really wonderful personally for me to meet my colleagues. And Jerry I've known for 20 years. So, you know.

I would like to frame my comments on the future of technology and education within the CSU in terms of a real kiss versus a virtual reality kiss perhaps between two avatars in Second Life. The experience of a real kiss involves the proximity of two people. What may be transmitted through this encounter is a sense of deep intimacy, connectiveness and love or passion depending on the two parties involved. What happens with the virtual reality kiss, I'm distance … I watch my avatars kiss as a vicarious voyeur. I imagine the experience indirectly. In the same way I must question the quality of relationships established through the cyberspace interconnectedness of Facebook. Is the relationship of Facebook friends the same quality experience as a gathering of compatriots over a fine dinner with stimulating conversation? Why would we not wqnt to preserve, value, and enjoy both options?

The experience of a "real" teacher, according to my definition, is that of a Zen master who leads the student to a deeper understanding of him or her "self" to a realization of his or her responsibility to others, to an epiphany about the meaning of life. This can be done through any subject. It is what we particularly try to do in the humanities when we are at our best in the classroom. This is the fostering of wisdom about self and society as opposed to the simple acquisition of "knowledge" which also certainly has its place in education. Teaching wisdom is teaching an intangible as opposed to teaching to the test. Are we unknowingly abandoning our mission to foster both wisdom and knowledge through the seduction of a quick fix virtual kiss?

Our love affair with technology is seductive. Some of us want to believe that it will solve all of our problems about student access in a budget crisis. We can do more with less. We can get rid of infrastructure -- the commons of the university its theater space, physical classrooms, and actual teachers -- and save lots of money that way. Others have done already: Phoenix Global and Western Governors University. Technology can meet the challenges of an overwhelming amount of data production and increasing student demand for 'training.' We can use open course curriculum and one monitor to supervise thousands of students as they pace themselves through the material in

their own chosen time and place with prompts provided along the way. We can become just-in-time education on demand. But, can we monitor the production of wisdom and understanding, justice and a sense of equality and equity this way? Are we being tested in our cultural moment of exhaustion and fear whether we will meekly defer our responsibilities as educators to vocational training and knowledge instruction in cyberspace? If so, we must embrace the role of the Western Governors University monitor. This could be done to save money and serve thousands of students who currently are being turned away from the CSU due to enrollment reduction and draconian budget cuts. Is the virtual kiss now enough?

The Bill and Melinda Gates Foundation, the Lumina Foundation and other elite philanthropic luminaries have told us for years that we simply have no choice. This is the new normal: more students less money. Gates has spent billions of dollars on a strategic restructuring of the K-12 system through technology as part of the voucher/privatization movement in the bleak reality of the failed No Child Left Behind legacy of the last Bush administration.

We laugh when a conservative school superintendant of a Midwestern state gets rid of teachers for the senior year of high school with a comment that laptops for each student will be sufficient. We have entrained through the onslaught of anti-teacher sentiments since the 1983 national report "A Nation at Risk" to believe that education has failed, that teachers resist change and should simply be replaced by technology, which can facilitate knowledge acquisition more efficiently than a real person anyway. The propaganda has made us believe that the virtual kiss is the only solution. Let's take a pause before the leap into cyberspace and online learning as the quick fix to fiscal problems and student access. Let's take a profound moment to reconsider what quality education may be in alignment between the real and the virtual. Let's do this before we dismantle forever the very substance of what makes this CSU the great institution it has become. Thank you.

[Applause]

Moderator Feucht-Haviar: All righty, moving right along -- next.

Jerald Schutte: I'll take that pause right now. [Laughter] Seriously, I'm both humbled and honored to be taking the place of a distinguished discussant and we wish Otto the best in his time of need. So, thank you very much for the opportunity to be here. That said, I want you to know that the irony of a panel discussion about technology and instruction, where neither technology nor instruction is being used, is not lost in this presentation.

What I'd like to talk about today is our core values. I take as given, we understand that education essentially has two fundamental goals. It's the accumulation and the dissemination of knowledge. Beyond that, everything we do is administrative tactical decision-making. So, if we really want to look at education 50 years in the future, particularly as it relates to technology, we're going to have to go back to those core values and say what is it about the accumulation of knowledge and the dissemination of knowledge that's going to be affected by technology? I'd like to limit my comments to those two things. God knows I could talk forever about it. But, I want to limit this to the five minutes I told Joyce I would restrict myself to. So, let's look at just these for a moment.

I think it's important to make a distinction between tactical, strategic, and evolutionary planning.

Tactical, at least the textbook definition, is that one to three year horizon where we are engaged in decision making processes that effect the next day, the next week, the next year. Strategic planning, on the other hand, involves a longer horizon typically five years or more in which we plan, in the context of a particular paradigm, what we're going to do. Evolutionary planning, on the other hand, is something that we have no ability to project. We are making decisions under uncertainty. We are making decisions under paradigms that don't exist. We're making decisions under technology that hasn't been invented yet. And that's a daunting task for anybody. (I told everybody at lunch, there's a, there's a difference between tactical/ strategic decision-making and soothsaying).
[Laughter]

Nevertheless, because the title of this panel is technology and instruction, 50 years into the future, I'm going to try and give you two glimpses of what I think is happening and what kind of profound effects it will have, from an evolutionary perspective. The unfortunate dilemma that human beings have, in projecting into the future, is they tend to operate in their own cognitive world. And that means whatever's going on at the time that they're thinking about it is presumed to be what's going to be going on in the future. Well, I'm here to tell you that the future is not representative of the past. I take as support of this thesis, the ideas that are contained in a number of writings, but which I will limit to the two that I'm most familiar with.

When Nicholas Negroponte wrote his book in the 90s called "From Atoms to Bits", he made statement about how tangible life objects are turning into digitized objects and how that has a profound effect on the way we approach our reality. Later, in 2000 Ray Kurzwell wrote a book called "The Singularity is Near", in which he points out that life is not linear; life is exponential. If we're going to understand the effects of technology on anything, and in this case education, we have to appreciate these two ideas as they relate to future technology

Kurzwell points to a number of things everybody's probably familiar with such as Moore's Law, where the CEO of Intel argued that you can put twice as many transistors on a chip every 18 months. But the interesting point is that Moore's Law is the fourth or fifth in a long line of exponential curves that have to do with technology. The same kind of law existed with vacuum tubes, the same kind of law existed with printed circuits and so on. And I suspect, as Kurzwell argues, that there will be new technologies emerging when we get down to the molecular level of processing. It may be biochemical, it may be crystalline, it may be carbon based, it may be anything, but it's going to be a new kind of exponential curve. Thus, the idea of this doubling should not be lost on the fact that we're dealing with one silicon chip today.

And that has some profound implications it seems to me. My biologist friends tell me that we have about a hundred trillion mechanisms in our brain that operate per second. And that, right now, computers are about 20 trillion. The idea is that, as the exponential curve turns north and we head into this advanced arrangement, for information storage and retrieval, we're going to surpass our brain's ability to process information, in far shorter than 50 years, probably 20. So, in the not so distant future, machines will be doing as many calculations in their parallel universe as our brain does in ours.

What's the implication? Well, if you combine the idea of information doubling time being a decaying exponential curve and the amount of information that is being tendered in the world as an exponential curve, there's an interesting overlay. Comparing those curves you find that there was a crossover point about 1998, which just so happens to be the time that the internet kicked into

second gear. So, we have an ability to process information linearly but an the ability to accumulate that information exponentially, which leads me to what my daughter used to say, "you can't get there from here". That is certainly true unless there is a paradigmatic shift that is going to allow us to take into account how that accumulation of information is stored, searched, retrieved, and shared.

If you've ever burnt toast or watched water boil, you know what an exponential curve is all about. Nothing happens for the first 90 percent of the time and then it suddenly you walk away and you smell the toast burning. Well, that's what's happening with our information explosion. For decades, in fact, in 1890 we had a 60 year interval for doubling time of information. Today it's about three years. By the time most of us retire in this room it'll be about a week. Understand, however, that doesn't mean this is all unique information. There's a lot of redundant information that's being produced and stored. God knows, if you look at YouTube, Facebook or Twitter, you'll see a lot of redundancy.

But, the fact is that there must be ways of dealing with that information. And one of the consequences that I think is going to happen is that we are going to develop, not short run phenomenon, (i.e. the next iPad or the next Cloud Server or the next whatever), but we'll develop whole new paradigms to deal with this. If we have the ability to store such information in real time, then, we have the ability to engage a virtual world that is real time. And it's not going to second life; It is going to be life. Consequently, I would propose something on the order of the following, a radical idea, but in production right now. It would be an holographic image that becomes your virtual professor. If anybody watched Jeopardy and saw Watson take on the two top Jeopardy opponents and beat them hands down, you'll recognize the immense capacity for computers to store and retrieve information. However, to recognize this paradigm shift, we must distinguish between information and knowledge? I think it's key to understanding what's going to happen.

The difference between knowledge and information, it seems to me, is that knowledge is the critical review and evaluation of information. So, what computers are going to do is be able to store and critically analyze and retrieve immense amounts of information. Until the paradigm shifts so that information becomes knowledge, it's still going to take the interface between a human being and the computer. The question I would admonish you to think about is, at what point does the computer provide the platform for the professor to help students to learn and at what point does the professor relinquish the platform to the computer to help the student to learn? I suspect that, in the next 50 years, you will see that transition.

The other point to be made is that, along with the idea that information is exploding exponentially, and therefore the paradigm is going to shift in the process of searching and retrieving and critically analyzing such information, we also have this idea the world is growing more culturally homogeneous. If any of you read Freidman's book, 'The World is Flat 3.0", You are now confronted with the potential that we've moved from nation states to global corporations to individuals controlling information; again, not coincidentally with the advent of the internet. Last year I read a national survey among college students in which they were asked what are the two largest population centers in the world, expecting that that would be China and India. The two answers were Facebook and Twitter, Facebook being at about 600 million followers and Twitter's about 250 million.

That people would cognitively deal with the world of population centers as virtual reality as opposed geographical reality, I think, is a telling comment. What we have done is flatten the earth by not

having globalization of corporations but of having horizontal infrastructures along peers. It probably started with Napster and moved onto other forms of peer to peer sharing, now manifest in the Facebook and Twitters of the world. There will be others that will come along. And just like MySpace is dying out while Facebook is taking over, so too will there be a successor to Facebook. But the concept is going to remain and evolve and I think that concept is a fundamental paradigm shift. We're not getting our knowledge from what Lazarsfeld called "opinion leaders" anymore. Rather, we're getting our information from peers. You don't need to go any further than six months ago with Egypt and now with Libya and others, to see how this works. That is why I think the second key component of the paradigm shift, beyond the information explosion, is this horizontal integration among individuals across the world.

That has some real ramifications for higher education. First I'm not so sure that the structure of the real world of higher education's going to last. I'm not so sure that the concept of the bricks and mortar campus is going to last. Rather, it will be replaced by the on demand, real time, lifelong collaborative learning concept is fundamentally different than what we do. Think about education for the last 2000 years. The model has been professors who have had their training at R1 institutions and receive a PHD by virtue of learning how to do original research. They become knowledge experts in a field. They go to other institutions where they teach classes and transmit that knowledge to others, the so called sage on the stage. The fundamental difference, it seems to me (which is already occurring, but clearly in the next 50 years is going to accelerate) is that we are no longer the knowledge experts. We are no longer the sage on the stage. I said at lunch, I feel like a guide more than a sage. What this new role is really doing is encouraging all of us to get into a proactive mode. Think about it, for 2000 years professors have gone into a classroom to disseminate knowledge, ask students to internalize what we say and regurgitate it to us. How much more passive could you be?

The internet and its successor technologies are creating a different paradigm. People are no longer passive. Professors can and must be active instructors. Today, I'll mention a concept in class and the kids are already on the computer checking to see if somebody else said something different about it, and play it back to me before I finish my sentence. I've embraced that. I've stepped down from my role as a sage. And we have to understand that students are being socialized into that mode and causing us to adopt our side of that role relationship. Therefore, there will no longer be the passive environment of a bachelor's degree. There will be the active environment of real time on demand learning as I've stated.

The reciprocal concept is also true. In teaching ourselves to be active instructors, we much teach our students how to transition from being passive learners to active learners. We're going to have to engage the process. And it could be any technology. It doesn't have to be internet. We're going to have to engage that process and we're going to have to take those students and put them into an environment where now they are engaged, not only with the professor but with the material and others who become the sort of Wikipedias of future knowledge.

Open source is going to take on a whole new meaning in the future. Open source won't be a programming language concept. Open source will be the way that peer to peer knowledge and consensus about knowledge is arranged. That, it seems to me, does not fit into a here and now physical environment. I would, with all due respect to Gertrude Stein, quote John Hertzog , who was a colleague of ours here at CSUN, who quoted Gertrude Stein when he said "there is no there, there; because if it isn't virtual, it isn't real". I think that that's something that we should take away from

this discussion, in looking at the next 50 years. Everything else about budgets, the latest LMS (be it Moodle, WebCT, or Blackboard); what we should be doing with the Cloud computing idea, thin clients or whatever, concerns the technology dejour, and therefore simply way stations along the way to this paradigm shift and ultimate reality. Singularity and social networking will ultimately fundamentally change our perception about the future of education.

Thank you.

[Applause]

Moderator Feucht-Haviar: Should we just sit in silence and reflect upon the possibilities? There are enough for years of silent reflection. But – we move on. Any questions for the panel? Yes sir.

[Inaudible]

Moderator Feucht-Haviar: Anybody want to take that?

Yamada: You have to start changing your RTP documents right away.

[Laughter]

Schutte: I would only ask you to say how does Wikipedia do it right now?

Hanley: I mean, one of the projects I run is called MERLOT great wine but, but also it stands for Multimedia Educational Resources for Learning Online Teaching. And, but what it really is it's a worldwide community of people who have expertise in the field. And in a sense, unlike Wikipedia, every piece of material is identified with a person who then brings with it a potential reputation of their judgment on that content. And, I actually think the point that Jerry made, the other Jerry, right, is around the in a sense the democratization of information transmission allows who your peers are and who your experts are and what they know to be more quickly and more integrated into the information review process. It's just not the faculty at R1 institutions who have the expertise on something.

And, when we're getting to the knowledge that is good for learning, I think there are huge numbers of faculty members who are in all sorts of institutions who have tremendous expertise along these lines. So, I think there is going to be a, in a sense, a reputation development process where you have trusted people making judgments around that information. And we get to know who you are and information will no longer be disembodied from the people who are producing it. I hope that helps you.

Moderator Feucht-Haviar: Yes.

Audience person: I have some comments and random thoughts based on all of the presentations. There are these two extreme scenarios where the difference between virtual and real or we are getting into extreme virtual and wondering about the value of the human. I remember having a conversation with a graduate student who asked a question :"Well what do you think about this?" And I said "what do you think about it?" And she said, 'I hate it when you do that." And you know, so it was so important to teach her that I am not the sage, you know.

At the same time when we go back to cognitive psychology that shows that one child, learns much better with peers physically there. The other thing that we know about attachment and learning also shows that the importance of human to human interaction. So, I think that maybe we should think about more differentiated sort of teacher where we say what type of learning happens in what type of environment. I once read students essays and this was while rating the proficiency exam, and they had talked about would you like online classes orface to face lessons. And they said oh no we crave this but we need the teacher. I would rather have the person in front of me. You know, that could've changed from just a few years ago. And the reasons were very interesting. One of the consistent reasons which really surprised me was that it teaches me along with my peers how to listen to others in a physical classroom because I have to stop and let the student speak and how to be civil to people. And I was thinking we might probably address issues of just learning environment.

The other thought that I had was on how Facebook people get information. But, what kind of information do people rely on from the peers on Facebook, you know? Is it on cars, you know, what should I buy? Is it really processes in chemistry? You know, how does that work or [inaudible]? I think that it's more important to really think in a more differentiated fashion about these things because I don't think it's an either or. I really think that it's going to sort of immerge in ways that you know would really tell us more about, you know, again how do people learn and what do they need to learn what. And, I don't think it's a sort of a [inaudible] for one thing.

Hanley: I'll start off. And, with two points, one, I think learning is about changing who we are, how we think, what we do. And, there are two elements that help change is one I have to understand this new knowledge and the second one is I have to believe in the knowledge right. And, it's often that belief in that is what is part of the human dynamic. When you look in social psych, you have to, I have to believe Terry is telling me the right thing and that it really is important to understand why sand script is written in a particular way for this characterize. I mean, that that's it's a, learning is a change in the human process. So, under those conditions, I not only have to have Terry explain to me so I understand but also the human dynamic is around changing people's beliefs on what I need to think about now. So, and I think that's something why the human dynamic is very important. And, I think you're right. There is differentiated circumstances, different contents with different type of learning.

The other thing I'll bring up is, and before I devolved into an administrator I the chancellor's office, I was at cognitive psychology my area of research. My area of research was called reality monitoring confusions, okay, all right. And basically what that is when you ask someone what happened, you often confuse what you thought what happened, what was a product of your imagination what could've been the virtual kiss, right, and the real kiss, right. And, it is amazing how confused we are around distinguishing what's really out there versus what's virtually out there in a number of ways.

And, I think, because virtual reality now, in a sense, creates memories, technology creates memories that are even more like reality, this is, I think, some of the issue that we have to begin to recognize is that people will begin to think their second life is real when in fact it can be disconnected from real life. And, helping people be critical about it. And the problem about, about reality monitored confusion is that people don't recognize it's happening. When, you know, an eye witness testimony, when someone says I saw Terry do it, when, and there are a lots of ways you can make that happen,

when, in fact, I am really misidentifying that information, right. It's because of the way our minds work. And understanding those cognitive aspects, I think, are going to become more and more important that we become aware of how our mind has to interact with all of these realities and it has to become part of our teaching. So, some of those are just kind of responses to it. The future is going to be a real challenge along those lines though.

Schutte: I'd just like to say a couple of words about this. First, I think we have to distinguish, it's a fundamental assumption that different learners learn different ways. Some are auditory some are visual, some, etcetera. And we have to be aware of that in applying any kind of technology because one size doesn't fit all. But, I think there's a "ying and a yang" to some of this technology. The ying is that the virtual reality that people throw around is that if it's a term that means the same thing to everybody. And it doesn't. The virtual reality idea is simply, in today's world, an escape mechanism. Many surveys have been done with people who use second life and gaming as their escape. Avatars become alter egos and so on. It's artificial because it's only taking into account one sensory experience, the visual sensory experience. And so, the virtual kiss becomes kind of a vacuous idea because we don't have the other senses involved. I guarantee you a virtual kiss is not the same as a regular kiss.
[Laugh - All talking]

And I'm supporting you. So, the avatar idea is just a poor man's substitute for one dimensional sensory experience. But, on the other side, let's go back to what Gerry said. The yang of that ying is that if you have poor memory or if you're having trouble thinking things through, the storage and retrieval of the future is going to allow you to assess that in spades and come back with a much more coherent view of what your real world is. And, I think that we have to take into account the plus and the minus of virtual worlds in a real world to understand whether it's going to cause confusion or help.

Yamada: I just want to quickly say that there's one other issue about a possible trend of a cyberspace university in which there's no, no physicality any longer, there's no buildings, there's no, you know. And it is, the other, one of the other chancellor's initiatives about community engagement, we're sending students out to a real community in which they have to participate with real people. That's what community engagement means. If we just engage from the surrounding community, what does that, what does that mean? What does that do? That would really reshape the meaning of a university based in a physical location and what we would attribute to the surrounding community. So, I want to throw that cautionary thought out there as well. Can't, we'd be so totally altered without any kind of physical location in which we were not engaged with people and the rest of the community, yeah.

Moderator Feucht-Haviar: Yes back in the back. Well, talk about the libraries and the new technology. I get to call on people every once in a while.

[Laughter]

Hanley: Great things are happening in the libraries.

Audience Person: I mean we are in the virtual we are probably more engaged than most people think we are. I mean, we communicate with students, most, I mean still in person, they still come in the library. But it, the communication and sometime they will be sitting on the fourth floor and

sending you a text message to the reference desk. They will not go and talk to that person and so, that virtual world is definitely here. And, and we, I think we're also here to help with that transition of [inaudible] information to knowledge. I think we can use it as, as librarians and as information people we can help with that transition because that is not that's not an easy transition for a student to make. And I think we can help them there in conjunction with faculty. S o it's a dual relationship.

Hanley: Can I comment about some cool stuff? All right.

Moderator Feucht-Haviar: Cool stuff.

Hanley: Yeah cool. All right, now think about, now the libraries used to be you can't leave your fingerprints on any content in the book, right, the whole idea to preserve the native quality of content in a book. And you actually could know did someone else ever use this book for. The whole idea is to keep it pristine for everyone to come to the new type. Now, when you go do a search for something when you're in business or chemistry, do you think you're the first person who ever did that search? No.

Audience Person: It comes up in your search bar.

Hanley: Right. And so, there's something that we've spent about seven years doing and it's called the black box or BX Recommender System that what we've done is we've actually looked at user behavior in searching for content out in all the libraries. We had researchers, Los Alamos Lab do, looking at patterns of search behaviors and then begin to realize that, you know, Terry and Jerry, they're really smart people. And when they saw I started looking for stuff in business or Southeast Asia studies. When they found an article and then they found another article related and then they found another one, well maybe if I'm looking for the same thing, maybe I can suggest, you know, there are people like you who were finding stuff like you're looking for and it can help advise your search services, all right.

So, by now instead of saying we want to discount the expertise of our users in discovery we actually do a rather extensive analysis of where people are finding. And it says when you find an article it comes up with a little bit of kind of Amazon type thing or this thing, people like you have found, people who found this article also found articles like this, right. Now, think about the time saving aspect that's important but also about the ability for, in a sense, the community's intelligence to help the retrieval of information. I think that's important. Jerry, when you have vast amounts it's going to be more difficult to find everything. And these are where librarians who have expertise around what the stuff is out there and how to do the discovery process can make your life easy by helping you find that other information. And those are, those are the cool stuff that's happening in library sciences.

Audience Person: I think that that whole [inaudible] I mean, you know, that's that's, I mean if we're going, we're going to have some kind of period move but that goes into conjunction with what these recommend because we know that this is valid information. So, some of that we need to work together on that virtually or otherwise.

Schutte: Right. I want to ask everybody to just think about the following premise. There's an extremely high and positive correlation between the number of volumes in the library and prestige of a university. Harvard has 15.6 million books which by hands down the largest and is arguably the

most prestigious. What does that concept mean to the extent that the book is a concept no longer exists. What does the status of universities mean anymore?

Audience Person: I just want to make a comment about, I guess you could say an unattended consequence of this move toward online searching especially when it's mediated by the, you know, other people who found this also found that which is there isn't so much of the I guess you could call it happy coincidence. You know, you walk into a library and you're looking on the shelf and something you didn't find I the search, you know, your catalog search jumps right out at you. You pull it off the shelf and it's exactly what you need. So, it almost seems like a randomizing element that pop up[inaudible] things that [inaudible].

Schutte: Right.

Hanley: Right, in a sense yeah see, and I think what you're pointing out, there's two processes of discovery, one is search and one is browse, right. And this is really important, you know, Google is just a search tool. It's not a browsing process. Now, browsing requires a taxonomy of the organization of knowledge so that when you go to one spot there are related material associated. There's a somatic, in a sense, network of concepts. And, I think this is again where technology will help us build these somatic networks and say well what's related to distance and along these lines. And I think this is where I think these capabilities to do analysis of large quantity information can help. And you've got to have multiple ways to discover information. But, I think, you're really important is how does that discovery process occur, is going to be important.

Audience Person - (Ellis): [Inaudible] I take issue with some of the things you said, particularly that our core values are an [Inaudible] that my college experience was as significant in terms of personal maturation, activism, attachment to others, I met my wife, community solidarity, school spirit, however you want to express a school experience. And it seems to me as if there is a capitulation [Inaudible] to this reduction or simplification what the collegic experience is. And certainly some of those are accomplishable in different ways on-line, but it seems as if we have if not a philosophical, at least an organizational imperative to preserve and protect what it means to have a campus experience. And a, this seems sort of obvious to me and I have introduced resolutions to both department and university level and can't get traction or even acknowledgement from others that the campus experience means something. Am I the only one who believe that?

Yamada: You're making my point, thank you.

Hanley: Well that, I mean, I think when I talked about doing by learning that, in a sense, the university becomes the community engagement activity. That is that you need a place of reflection. All the things about good instruction and good teacher and good learning requires opportunities reflection. And what a university space does often provides that opportunity to step out of life and reflect on new things that I'm learning. And we need to preserve that for quality learning experiences. But, also, it can become a wall in which what's needed in real life is not always part of the reflective experience that occurs in the university.

So, I think, this is where technology can make it easier to bring the world like our library walks around with me no matter where I go. I mean, I can do searches to get everything in Northridge Library no matter where I am. So, bringing that experience and how do we bring the world back into the university? And that's where a lot of the community engagement aspect is.

So, I, and how does, I think one of the things, cost is one of the barriers for access to quality education. And, technology's one way to help reduce cost whether it's in time to do something, actual cost of the materials itself, the open education resources strategy is now everyone has free access to stuff that only privileged people in the past were able to have access to. So, I think that's what we have to look at is how do we make the cost of good learning low in a variety of ways.

Schutte: If I can just give a random comment to Ellis' question. As a good sociologist, you have to differentiate between manifesting latent functions. And obviously the manifest function is what I was talking about. There are all sorts of latent functions of any group experience all of which you've just mention. And I think what you have to do is look at the organization bureaucracy and its intended goals. That's why I said I'm not sure that the physical university (atoms) is going to exist in the future. I think that online education also has latent functions. And the latent function to online education is getting people talking to each other and interacting with each other more than they would in the classroom. If there was anything I learned doing online classes it's that collaboration is the name of the game. And it just so happens that technology fosters that collaboration better than just the few hours you spend in the classroom.

52:25

Audience Person: [Inaudible] So you know, a lot of this technology we are talking about give people a lot of access to an enormous amount of information. There's a lot of difference between that understanding and thinking. And so, what I find is the [inaudible] that they can look up but as soon as you ask them something that they can't look up they are totally stumped. And so, I think that that sort of the function of the faculty is not to provide information as it may have been in the old days it's to enable the thinking process. And I've yet to find a sort of an online mechanism that facilitate the same way in the classroom. So, I don't know if you have, technologies that you think do the same thing but I haven't, you know, experienced that myself. For example, the students will be happy looking up as soon as you give them some problems for a math question, even if it's a really simple math question, you know nine plus eight, if there is no tool [inaudible] try to think or try to solve because they're so used to this.

Schutte: Well, I think there are ways of doing it independent to the technology. Clearly the fact that we have a book and we have a lecture causes people to reconcile those two things. But, we can embrace the technology to actually help that sort of synthesis. I was telling the panel at lunch, one of the techniques we use in the class is every time I give a lecture I get this series of links to other places, whether it's the World Lecture Hall or whatever, that's talking about the same thing that I just talked about. Their assignment is to review what that person says and return saying what's different about what the two approaches. I believe this works, because as soon as they start recognizing a disconnect, their brain starts resolving it. And, when they bring it back to me I can reconcile it for them, with such responses as, "Oh, now I understand". Whereas if we didn't have that parallax view there would be no three dimensional discussions. It would be very one dimensional and flat.

Hanley: Yeah. And, I think in part it comes down to what are the student learning outcomes that we define for our course? And then how do we assure the pedagogy matches those things? If in the past we've said you need to know this research in cognitive psychology what the memory is, you know, then it really becomes I'm a provider of information or knowledge and your job is to repeat it back to me I some other way. But, when you really begin to say the outcome is to solve this problem. And now, how do present that task that climate for you? Looking up is insufficient in finding an answer to that math problem isn't what's in a sense valued in how you're going to grade

by. And, students will, you know, again, we have to reorient them to new types of critical thinking student learning outcomes problem based pedagogy that I think can be very helpful. And for us faculty members, I mean, we haven't I'll say been provided all the knowledge and practice of how to design excellent student learning outcomes. And what are the different pedagogies that help us get those? Knowing the content of your discipline is not all you need to know how to teach that effectively because we hire scholars and yet employ teachers. And, for so much of what we do without insufficient support for that. And so it is a challenge. And that's, I think, what the university has to begin to look at is there's a new type of learning that we're going to have to support ourselves doing.

Audience Person: I have a question. In a way we are preparing students for the real world right? And so at some point they will be working for a company and very likely it will not be an on-line company. So if we are moving toward a virtual education aren't we creating a disconnect from what they are going to experience when they actually become employees?

Yamada: It depends on which kind of company they're going to be working in. There are multinational corporations where people are working in India, various places. And it's a collaborative problem solving thing. So, those jobs are out there too, yeah.

Hanley: I think like the point earlier that there are all types of skills that are going to be important, you know, the face to face skills, dealing with reactions. When someone, a point that Jolene was making this morning, when someone disagrees with me and I'm in a face to face situation, I have to learn to cope with that. And how do I, in a sense, have a dialogue when there's an intense disagreement on these things? How do I surrender my viewpoint and give myself a chance to embrace what Terry's saying? That takes practice and people learning to do that. And there are times when, in engineering, engineering in the world today is a multinational multilingual multicultural process that is communicated electronically. And you rarely see the other people on the other side. And you have to find ways to articulate what you're doing clearly when you're not physically there to do that immediate correction. So, I think there are multiple skills that are going to be important for preparing our students for the future.

Schutte: I'm not so sure that that's a problem with just technology. For example, we train people to be individuals, we give them tests as individuals, we grade them as individuals, and we send them out with a BA as individuals. And then, they get into the corporate world and the number one complaint of these business environments is that they don't know how to team build and work as groups. So, those problems exist along the way whether it's virtual or non-virtual.

Audience Person: I was just going to make a comment. In the languages we recognize all this. And technology has been used in language learning forever. And, recently, because we understand that not everyone's going to be able to [inaudible] the technology is brilliant for allowing us to do that. And we actually created a course that is called Virtual Study Abroad. [Inaudible] who are not able to do it physically that are now able to experience it literally. And we've found that. [Inaudible]

Hanley: And sometimes, you know, it may be better to go to France and experience it. But, is that virtual experience, you have to say it's better than not having that cultural at all? And it's the same thing, you know, I talk about open resources, you know, and say if your student can't afford the book, is it better than to go without or go with what's available online that can support some of their

learning? And that's some of these opportunities where you have to say that how do we make all these experiences somewhat more available than we would have before?

Moderator Feucht-Haviar: Anything else?

Audience Person: I just have a comment. I think that the whole issue of getting information and information being readily available as opposed to [inaudible]gathering knowledge. I think that that is a critical difference because I have noticed this too, especially in the area of journalism, you listen to reports then, and they are becoming increasingly shallow, it's almost like journalist who are reporting them have no idea about the history. And, I'm not even in the field of history it just everything that I picked up from reading the newspaper or whatever it may be, just listening to the news. And I think that the, you know, that is just an example of the virtual confidence that people have that just because they have a piece of information they know. And that is just, you know, you see that that is disappearing because we are prioritizing the saving of time. But, you know, it's okay to give up quality for speed. And I think, it is somewhat related to what she said this is about just making that distinction or even understanding that you just have to wait to get better. [Inaudible]. Yeah, yeah, because you know, just because you type in some name and bring it up doesn't make you knowledgeable. It's [inaudible].

Schutte: Right.

Moderator Feucht-Haviar: **Moderator Feucht-Haviar**: Considering the introductory presentations made by the panelists and the questions raised, one of the things that strikes me is if we were looking 50 years out and we're looking at some of the things we've been talking about, you can say the conversation is not going to be just about online teaching and its merits (or not). 50 years from now – even 5 or 10 years from now, it's going to be about the whole of technology. That is, there are already a wide range of ways in which information is created, stored, organized, and accessed (in many forms – text, images, sounds, numbers, and more). Information is available and will be more than at your fingertips in 50 years (might be implanted in your head) -- it is information that you can exchange, that you can access in various ways, that you can bring into a traditional classroom, that you can bring into your work. The notion of this integration of technology in your learning, civic, and working life enables you to pose the question when you have it and explore the possible answers and the knowledge behind them in as much depth as you wish. Given that, delivering content may be less important as a component of what we do in the University (or even the K-12) classroom. How much will we need to deliver the content when the material is available on demand – along with a lecture or discussion with the author of the book or you will be able to see the book and the knowledge it conveys illustrated in various modes that allow one to look at the content in various ways – you will be able to (well you can now in many cases) select ways to look at the content that work for your learning. The options for individualized learning and/or supplemental instruction will be bountiful.

But then, like anything else, you sort of have to decide what you're going to do with that greater resource and possibilities the technology provides. The fact that we can look at the human genome or we can look at atoms doesn't mean we know what to do with that knowledge – clone ourselves, perfect ourselves … or similar questionable enterprises. But, does having a wider access to the delivery of content open the possibility of spending much more of the actual instructional time creating habits of mind, creating wisdom, creating judgment, creating reflective capabilities, creating a give and take between people who are bringing information into the conversation from a range of sources rather than relying for content on just one instructor. Can the instructor be a co-learning, a

guide, someone leading a reflective and critical conversation fostering students' ability to make judgments and to be a contributing part of a larger and more positive human community. To press that idea of fostering habits of mind further than we've been able to in the ten of fifteen weeks we're sitting together in the classroom when most of that time is spent delivering content. You know, there's very little time in the current traditional class for analysis, reflection, probing, wrestling with the knottier problems raised by the content, and the broader options of creation and advancement as a practitioner in the field. We might spend more time asking questions like -- what do you think of that and how do you solve that problem? Or why is this a faulty argument and how are you learning to think and reason and apply? So the possibilities that the growth of technology provides might be quite a powerful tool allows the classroom to be a place for exchange about the content rather than just the presentation of the content. And, you know, the challenge over the next years may well be what do we choose to create out of the broader range of options technology affords, who takes charge making those choices, and how do we keep a voice in choice?
Are there any final comments? I have been got the time signal for this session. One more question or comment?

Audience Person: (From math department – with heavy European accent) [Inaudible]

Moderator Feucht-Haviar: Unless there's a breakthrough.

[Laughter]

Audience Person: (From math department – with heavy European accent) [Inaudible]

Moderator Feucht-Haviar: Which brings us back to that notion of what really defines that creative craft of teaching and learning and the choices you make and the information you look at and the questions you raise? And the core work of teaching -- making creative choices among possibilities to craft a powerful and effective learning experience, I don't think, will change much in 50 years. Thank you all.

[Applause]

[Silence]

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