

## Crystal Livingston

### Director of Educational Technology Support Services

*Interview conducted by  
Katherine Toepfer  
In 2016 in Arlington, Texas*

Disability Studies Minor  
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#### **Biography**

Crystal Livingston was born in Dallas, Texas at the Baylor Hospital in 1955. She attended the Eastfield College, part of the Dallas County Community College District. Upon graduation Ms. Livingston took a position at Southwestern Bell in 1977, where she worked for eight years.

Upon departing Southwestern Bell, Livingston took a position at the University of Texas at Arlington in 1986 in the audio-visual department. Since then, she has worked in the audio-visual department, the radio/broadcast department, and classroom support. She currently serves as the Director of Educational Technology Support Services. She has worked closely with Jim Hayes and others to make UT Arlington's classrooms more accessible for students with disabilities.

#### **Topics discussed**

- Background
- Career at UT Arlington
- Early classroom technology
- Early accessibility in the classrooms
- Relationship with Jim Hayes and work with the Movin' Mavs
- Educational technology and accessibility
- Working with the Office for Students with Disabilities
- Infrared hearing technology and hearing accessibility in classrooms
- Personal experience with disability
- Ensuring ADA compliance and physical access for students and instructors
- Impact of wheelchair basketball on accessibility at UTA
- Video capture of lectures and closed captioning
- Evolving technology and predicting accessibility
- Awards and installing PC's in all classrooms

## Katherine Toepfer

This is Katherine Toepfer interviewing Crystal Livingston for the UT Arlington Texas Oral [Disability] History Project. Today's date is Tuesday, March 8, 2016, and I am in room 323 of Nedderman Hall at UT Arlington.

I am here today to talk with Crystal Livingston about the technology and accessibility here at the UT Arlington campus and in the classrooms. Thank you for participating in the oral history program.... Shall we start with some background information, early childhood?

## Crystal Livingston

<topic>Background</topic>

I was born in Dallas, Baylor Hospital. Lived there for most of my life. I came...I kind of moved around as I grew up and married, and had children. Eventually got a job at Southwestern Bell and I worked there for eight years until they divested. When they did, I lost my job. And so I was unemployed for about a year and I knew a guy that worked out here and he said do you know we got a job open out here? He said I think you'd be a good fit for. So, I applied, and I was hired, and that was in 1986...August, and I was so excited (laughter).

You know, I just...it was so cool for me to be out here because, I love the anticipation, you know, and I still do. They come to school and they're ready, they're ready to embrace and learn and get out and be big people and adults and do big things when they leave here. I used to come out here all the time on the day before school and just walk around the campus and just watch the kids. How awed they were of this thing or that thing and that they really understood that they were on a university campus. You know, they that had puffed-out chest; we're really doing this.

And, I did that for years—years and years. I told a friend that the other day, I said, "I really need to do that again. I haven't, I haven't done it in a few years and I need to do that". I used to bring the motorcycle out here and I'd park it and just walk around, that in itself used to cause some head turning. But it was fun. I enjoyed it and it renewed my...passion for what I do here. And, every now and again I need to renew that again. (laughter)

## Toepfer

So when you first started here, were you doing what you do? And if, if you weren't would you explain that and how you transitioned?

## Livingston

<topic>Career at UT Arlington</topic>

Oh, the transition was a long one, it's lasted thirty years. (laughter) I started out as an AV tech. I worked on sixteen millimeter projectors, slide projectors, um, oh gosh, audio tape recorders that were reel-to-reel—they even had eight millimeter loops that the science [building] used that showed an amoeba dividing or some other microscopic critter, and I worked on all those things, and you know they break. They were basically mechanical things, and they had parts that you could actually buy and replace and we had an AV checkout at the time. And so, if an instructor came over and said I want to show this film in my class at this time in this building this room, then they would schedule us. We would load up the sixteen millimeter with the film on it. Roll it across campus. Set it up in their room. Sit with it, start it. Stay there till it was done; change the reel if it was a two-reel film. Put it back on there. Play the rest of it. Bag it all up and take it back to the shop, and that was me and probably a couple other students.

That's what we did, you know, besides repair. That was the function we served on campus. We eventually moved out and we were in the Library at that time, we were in the basement of the Library. We moved out to Fine Arts [building]. And instead of kind of going around and setting people up, I had then kind of migrated up a little, on to an AV Supervisor. Part of that was a little check out, and people would come and check these things out. They would use them in the class, and then bring them back. And so, that went on for a long time.

And then I went to, into broadcast I did, I was a radio—actually I was a radio television technician I think. And then I moved from that to radio television supervisor, and that was largely working with the Communication students and anybody that used the studio. That was their broadcast technology program. And then, I guess it was in 2005, they split that department. It had it started out when I was in the library, it was called the Media Center. Then when we moved across the street they changed our name to Video Services, Video and AV services. And then it kind of blocked off the AV, and just was Video Services. And then they split that department and created Classroom Support.

And that was in 2005, and I was manager of technical operations at that time and I kind of hung out in that position for long time, and then about four years ago, I guess maybe three or four, they made me a director and I'm not sure how that's going. It varies on a given day. So I've kind of had a lot of renditions, but across the board I have worked in this university's classrooms since I came to work here thirty years ago; so, I've seen a lot of changes there.

#### **Toepfer**

Speaking of those changes, let's just dive right into that. What was the campus like or what were the technologies in the classrooms like when you first got here?

#### **Livingston**

<topic>Early classroom technology</topic>

None. There wasn't any. The only technology they might have had was when I first came here—very, I mean my very first job here was to set up University Hall first floor classrooms with a remote control system so that they could put their slab projectors in the back of the room, stand at the front of the room, and push a button and have the slides change. That was the highest tech thing they had ever seen, and they just thought it was neater than their first bicycle. I did that in all the first floor classrooms. We didn't have very many classrooms at all that had what we would call enhanced audio, microphones, speakers in the ceiling, anything like that, that was pretty much it. There just, there was a few rooms, very few rooms that actually had a sixteen millimeter projector that was in a booth at the back of the room that you could load film on and they would come over to the library, check out the film, take it to their class, load it, and run it on a projector that was installed there. That was big stuff, you know and that was about as big as it was then. It's changed a lot. (Laughter)

#### **Toepfer**

In those early days how did you guys try to make the classrooms more accessible for those who had disabilities, even when there wasn't a whole lot of technology?

#### **Livingston**

<topic> Early accessibility in the classroom</topic>

To be honest at that particular point it wasn't something that was in my little, under my little umbrella. But I will say this much, everywhere we took equipment we pushed it on a cart. There was a lot of places you couldn't get those carts without dragging them upstairs. Probably the one building that I remember that always has had a ramp is University Hall. It had that little 's' ramp down at the end. The Library you could go in on the first floor. I don't

think Geoscience had a ramp, I don't know if Science Hall have one. There were a lot of buildings that you could not enter without going up steps. And I know this because I had to use all the wheelchair ramps where there were, to get these carts that had these sixteen millimeter projectors and stuff like that on.

It wasn't until probably—they started the process of lowering Cooper Street probably in '87, no, probably about '89. That project completed in '91, and until that project completed, we had to actually go all the way down to Mitchell [Street] to cross the street and take anything back up. Our building, at that time, we had to get it down to the studio and take the ramp down. Some time in that period they put a ramp on Fine Arts, and that's when I began to notice that the campus was changing was probably in, probably late '80's. It might have been before then. Jeff Johnson, he was there then—Bryan Sims, I don't know if he would have been there, Jeff, definitely was—I don't know if he was in Facilities. But there's a lot of people here on campus that would have been part of Facilities that would've been part of that.

There were a lot of—the thing that I got was the wheelchair basketball team. I thought those suckers were incredible. Well, I had never heard of the Movin' Mavs before I came here. And I'd been here for a couple of years when we moved to Fine Arts that put me a little closer to P.E. [the Physical Education Building] I kept seeing these wheelchair guys going in and out and I thought, "Hmm." And so I started paying attention to the newspaper and I was talking to the guy I worked for and he goes, "Yeah, we got a wheelchair basketball team you ought to go over there and watch them sometime." Well I just kind of eased over there and was looking in the door, and I thought, "Oh my gosh, these guys are great."

And that really kind of started the wheels for me I guess and, and what it took to get around on this campus. I've never really given it a lot of thought. I thought these guys got to go to class they were, you know they go to school here. And I wondered then if it limited what disciplines they could take given which buildings they could get into. Because I don't know when I first started seeing them [ramps], I don't think they [the buildings] were all accessible. So you know it just, kind of put this little thing back here [points to head]. And I eventually videotaped these guys just because I thought they were cool.

And I got to know Jim Hayes who I thought was the coolest, just loved that man to death, oh he was just the neatest man. Do you know he fished? No. He bass fished, and I bass fish, or I did at the time, now I croppy fish. I asked him, I said, "How do you, how do you"—I said, "I'm not trying to be nosy or anything like that" and he said, "You want to know how I do that boat?" And yeah I said, "You know, we have a boat I know I we do it I do you pull it up?" He said, "I back it in until it floats off and I have a long rope, and the boat would just float out. I get back in the truck, I leave my chair, get back in the truck." No, he said, "I have to load up my chair, get back in the truck, go park the truck in the trailer, the get back in my chair, roll up to the dock, pull the boat back." And it was a nice bass boat. And he said, "I pull the boat back. And then he said, "I have to get in, get my chair, fold it up, put it in the boat, and then I tie it up and go out."

And I thought, I thought, I told him, I said, "You really want to fish pretty bad don't you?" And he laughed and he said, "I love it." He said, "out there on the water, I'm not disabled." And I thought that was the coolest thing. But anyway, that's a piece of trivia there for you.

## **Toepfer**

So I know that Jim Hayes was a huge part of this campus—so not only were you guys' friends, but did you guys ever work together? Did you ever—did he give you—try to help you within the classroom management stuff?

## **Livingston**

<topic> Relationship with Jim Hayes and work with the Movin' Mavs</topic>

Not really at that time. Like I said at that particular time, changing the classrooms wasn't really part of what I did. I took care of the classrooms, at least the equipment. But nothing lives there. You know it was a matter of putting it in there and take it back out. Like I said I thought about it a lot but I didn't, I just wasn't in a position to do any changes.

I know that he [Jim Hayes] fussed about his space over there in P.E. [Building] because I don't even think they had air conditioning over there. It was terrible, and we fixed him up some cameras. He wanted to be able to videotape his guys. And so we kind of put together a little package and installed it for him so he could videotape the guys playing basketball and he could critique them. And...but you couldn't put anything on the floor where it would stay there and you can put it within basketball range. Otherwise, if you caged it, then the cage would be like right in front of the lens. And so we ended up putting these things up, like pretty high, and then zoomed them in so that you could see what he wanted to see. And I had a guy that would switch cameras depending on which goal they were playing towards. And that was probably the first thing I did for him.

We did several other smaller projects similar to that after that. But, we just, you know if he was going somewhere and needed a microphone or there was a couple of times they had, I guess it would have been their awards program that they would have at one of the local hotels, you know it was a nicer venue and we'd do mics, make sure his mics worked and that sort of thing and that was all. That was all fine and we didn't have a problem with that but I just had an incredible respect for him and he was just a neat guy.

**Toepfer**

So who else have you worked with in your time, your whole time, working on campus?

**Livingston**

<topic>Educational Technology and Accessibility,</topic>  
For accessibility?

**Toepfer**

For accessibility, yeah, technology changes?

**Livingston**

Penny Acrey [current Director of the Office for Students with Disabilities] has probably been a big driver, because she's one that was on board when we became Classroom Tech, you know, Classroom Support and now Educational Technology. So these kinds of assistive things, is things we have to think about. Probably...probably maybe at least ten years ago we were invited to participate in Facilities' construction and renovation. That's when accessibility became a thing for me, because as these spaces were renovated they were made ADA-accessible, that was all part of it, and then ADA became part of my life.

It's like we can't hang a projector below seven feet from the floor, you know and you have to have cane detection under monitors or anything that sticks out more than 4.5 inches from the wall. You have to have cane detection down below it [The Americans with Disabilities Act of 1990 requires headroom of at least 80 inches and also bars objects from protruding more than 4 inches from the wall if they are within the sweep of a cane and lack a leading edge.]. Accessibility spaces for wheelchairs, spaces for table and chair. You know, the assistive listening thing didn't become a real thing for us until probably three...three years ago, and part of my group is lecture capture. And it's recorded, its recorded media that the students can go back and review as many times as they need to. If we have a hearing-impaired student

that has their paper from OSD, Office of Students with Disabilities that said they need closed captioning, because that recording is something we manage, we take care of that closed captioning.

Now we have a captioning service that we currently use, you cannot not do this, and it's not free. That's been the current fuss I guess. We've managed to push that back to the department that the student is enrolled in. It's unfortunate that we've got maybe three students and they're all engineering. And so but it's really expensive, it's probably about \$3,000 a class, a semester. So this semester alone, it'd probably be \$25,000 a ticket for them and that's an unfunded need. But it's made some of these things; it's made me more aware of the hearing impaired.

Now the visually impaired is something that I've kind of always been aware, it's you know— You've seen them when they're walking them to their classes, and they'll go over that route now and over that route you, and you'll see them before school starts so that they know how to get to their classes and that sort of thing. And that probably was my migration truly into the disabled world was through Facilities and that project.

### **Toepfer**

Do you face a lot of challenges with the OSD, with the Office for Students with Disabilities? Do you guys have a lot of—do you have a good working relationship with them?

### **Livingston**

<topic>Working with the Office for Students with Disabilities</topics>

We do. It becomes in some cases—my goal is if they have a hearing disability or visually impaired, or any of those things to me is more important than a student that does not know English well enough that the closed captioning would benefit them. I can't afford to close caption everything we do. We've got seventy classrooms on campus that have this recording capability. We probably record 200 classes a semester. We can't, we can't close caption the whole thing, although OSD [Office for Students with Disabilities] would like for us to because it'd help everybody. And I agree, it would, it's just right now, it's just not financially feasible, you know.

Prior to the infrared technology I showed you [before the interview] for assisted listening, there was a looping technology that was out there. Horribly expensive, horribly expensive and we were being pushed by OSD to put this in, but your hearing aid has to have a T-coil [A telecoil boosts signals from phones. About two-thirds of hearing aids have them, especially behind-the-ear aids and cochlear implants. They are less common in in-the-ear aids and in the canal aids, which represent the majority of hearing aid sales.] and my hearing aid is actually quite small, see [removes and shows hearing aid] but, a hearing aid large enough for a T-coil is huge, it's a big thing. And it's much larger than what most people want to wear because it's very obvious you're wearing hearing aids. And mine, a lot of people don't even notice it. So it's kind of a... it's a... it's a thing, you know. I can put it in, spend the money but, if you're hearing aid does not have a T-coil, it doesn't work. Mine doesn't, it's not big enough.

And so the infrared technology, if we decide to go that route, is actually something that would be pretty easily integrated into the classrooms, and it really wouldn't be that big deal. I mean I don't know what this stuff costs, I don't have a clue. I'll probably know within the next year what is going to cost because we do plan to build a new building.

### **Toepfer**

Since you explained the infrared to me before we started recording, could you explain it one more time?

## Livingston

<topic>Infrared hearing technology and hearing accessibility in classrooms</topic>

Infrared is a technology that uses our—its boundaries are solid walls like if you have a wall, it stops at any solid surface, so you don't have to worry about bleed over. With the loops, you have bleed over, and I'll explain the loop here in minute but, basically it's a signal that's passed to a receiver. Normally the students wear the receiver around their neck, it picks that signal up, they can use their own hear—ear buds or headphones, they plug it in, they listen to the lecture. At the end of the lecture, they keep their hear—their ear buds. To my knowledge, there is a way that some hearing aids, not all hearing aids, could use a streamer but that streamer plugs into this other box and it kind of ends up as a double box, bulky thing. But that would allow them to use their own hearing aids.

I think my hearing aids would probably be able to pull that off if they're Bluetooth-enabled. It's just that the technology for this assisted listening is moving forward, and this is probably the best option I've seen so far. The one thing it doesn't do, I mean, it takes out of the mix—is the current system they have is FM, just like your radio, and it's on a channel. The student wears a receiver around their neck; the instructor is given a microphone that's tuned to that receiver. And then when the instructor talks, the student can pick it up with that receiver. Now if there's another hearing-impaired student in the class, the instructor only needs to wear one microphone, and everybody that's wearing one of these receivers can hear it.

With the infrared technology, the instructor doesn't have to wear a mic, just the house audio is fed through these emitters and then the students they just pick you know, a receiver and they just wear them. Some of them they'll tuck them in if they're embarrassed about it—they'll tuck them inside their shirt. It picks it up, it doesn't matter. But it doesn't bleed over to other rooms, it stays within that space. It works really well if you have a room that has an accordion door. So as soon as you open that door, it, it's lost that boundary, and so it will feed over into that other space. And so that's kind of nice, it'll be a little easier to retrofit in some of these spaces on campus.

The loop technology is actually a coil, and they take copper bands and put them under the carpet in a specified engineered location to miss metal and take in account any metal and bounce in the room. It's done in a zone so, if the instructor's inside the square, the student has to be inside the square with them. The problem with looping is there are no boundaries, you can't get this loop too close to the loop for next door or you get cross-talk. There's a lot of issues with looping, but they've had great success with it in some places. It's horribly expensive; you actually have to tear down the room to put it in and then put the room back. It physically cannot be installed unless the space is already built. So even though the SEIR building [Science, Engineering, Innovation and Research] is new, it's under construction, there's no way the rooms can be engineered for looping. The space has to be there in order for them to engineer the loop in the space that it needs to go in and so that makes it kind of cost-prohibitive.

I'm surprised that anybody's put this in. I know that there are some people that have [Hearing loops are common in Europe, including in all London taxicabs and most British post offices, churches, and cathedrals.]. I'm glad at this point there is an alternative solution that doesn't require deconstruction of a space to put it in you know lay it back down. That's the technology that requires t-coil in your hearing aid. Cochlear(s) [implant] they don't carry, they get ambient audio, and all of our classrooms have enhanced audio with speakers and so the cochlear [users] should be OK, wherever they are.

## Toepfer

On situations like that if you were going to retrofit or if you were going to add the infrared to a classroom would you test that out with students? Would you do a test group or just kind of rely on what's already known where they're being used?

### Livingston

Well, that's what we were going to talk to [Disability Studies Minor Director] Dr. Rose about. Because I honestly don't know. Although I wear hearing aids, I'm not a long term user of assisted listening in a group environment. My hearing is a low-frequency deficiency. And so all it [my hearing aid] does is augment that. So, I do have hearing without hearing aids. Which I'm sure it probably flips people out that I'm in the audiovisual world and have been most of my adult life and that I have a hearing deficiency, but, that's something that we've got to discuss that I'm not sure....

I'm not sure how to move forward with this, and there are to my knowledge—these are the only two solutions out there for assisted living, I mean listening, besides what we currently do with the FM system which has worked just fine for years. You know it is what it is. The students don't have to check out the little box. You know it's really not going to change that a whole lot. I guess my hope with all that is that the clarity is better in our system than what they're getting now. I just, you know I don't know, I don't have any experience in that. This will be my first one. Wah! (Laughter)

### Toepfer

You mention that you have your own hearing deficiency, was that something later on, like adult loss? And has that played any effect into how you now think and feel about....

### Livingston

<topic>Personal experience with disability</topic>

It does a little. The deficiency I've had it for several years—it was one of those things that it sounds kind of ignorant but hearing aids are horribly expensive. I went and had my.... I was at a show, it was National Association of Broadcasters, and they had a hearing booth and I thought what the heck. So I went in there and the guy said, "You have a very odd hearing deficiency", and so he did it again and he said, "You have a low frequency deficiency." And I said, "OK." And he said, "Well, most people lose their high tones first." And so I thought "OK". Well, I kind of kept that paper, and I carry it in my backpack, I carry all my stuff in a backpack. I carried that around with me for probably four years, five years.

Finally, I was talking to a guy up here that had gotten hearing aids, and he told me to go to this audiology group, and I did. She put me in a set of hearing aids, and we went outside, and we set down in their waiting room and everybody was talking and I was like "Oh my gosh, this is great." I was thrilled to death. But it was like almost \$6,000. And I, (laughs) the insurance paid like \$500 an ear or something, you know I can't.... It wasn't [much] considering the total cost of the thing, it wasn't much. And so that was out of my price range, I just, I honestly couldn't afford it, so I didn't do anything. I just struggled with it. Mostly with women, I don't have much trouble because their voices are in the octaves. It's the guys that I struggle with, and it's unfortunate that most of the meetings I'm in are 90 percent guys. And so, there were probably three or four guys on campus that when they talked to me it just, it was nothing, you know, and I had to get very close and pay very close attention. And we had to be in a quiet space for me to be able to hear what they were saying, and that was becoming more and more a problem.

And then I got a thing from Blue Cross Blue Shield, and they had partnered with a group called True Hearing. So I called them, and they told me that there was a audiology group that was a True Hearing partnership at Kos/Danchak [audiology group] that's over on Randol Mill,

so I went over there. I ended up getting these hearing aids for \$3250. It's still a chunk of change, the insurance still paid some but, it got it down where it was somewhat affordable. That was some time ago, and I've got two more payments on it. (laughs)

But yeah, it's made a big difference to me because it made me realize that a lot of people have different hearing deficiencies. You know mine's a low frequency, probably the best thing I heard out of that is the lady told me, actually both of them did, both of the audiologists. The first one said it out of her entire patient practice, she only had two with low frequency deficiencies. She said, "The up thing, is [that] they've been a patient of mine for ten years, [and] they've not gone profoundly deaf." I'm like, "Yahoo!" The lady up here that's at Kos/Danchak, said that of her patients, she only has four. But, she's not had the four for very long, and she said, "I don't know what the history is on that type of deficiency." And I was like OK.

But the best thing about it is these hearing aids are tunable, and I'll probably have them for my life because they can be changed. It's all electronic now. So you buy a set of hearing aids now unless you just don't like the color of them, twenty years from now, they are tunable and they [audiologists] can change what they amplify over time. Now, they can't create sound where there isn't any. So if I go profoundly deaf in that low frequency, it's probably gone. I mean, it's only so much you can amplify something but if my ears can't hear it, it won't be there.

But is it really made me think about people that did have hearing loss or that were born that way. You know, what can you do for that? There's you know, I'm limited by dollars and cents in the building confines, you know these buildings were built long time ago before anybody did anything like that. Sign language was the closest they've got and we still use that today. So, it's still out there.

**Toepfer**

Was it hard for you when you found out you were...[when] you had a hearing loss?

**Livingston**

No, not really, because I knew I had a hearing deficiency because there was just too many—in my world it's called null. It's like a phase shift. When the two phases touch, when you hear audio, it actually nulls it out to zero. So you don't hear anything. I've been in the audio world for a very, very long time so I understood what was happening, I just didn't know with the depths of it. You know, how much of a hearing loss I had, I think it was gradual over time. You know, my dad wears hearing aids but his is a high-frequency loss. There really isn't any telling, it's probably all those concerts I went to back in the day. (laughs)

**Toepfer**

How do you find the attitudes of the community of Arlington when you guys are going to make changes? Do you have to deal with a lot of bureaucratic issues?

**Livingston**

<topic>Ensuring ADA compliance and physical access for students and instructors</topic>

Not today, not too much. I know that when I first started working with the Facilities group it was always difficult to, if we went into a classroom say, Science Hall, I don't know when that building was built, it's been there a long time. We rebuilt and did a renovation for Science Hall 100 and 101, and they had to re-pour that floor to make it ADA accessible. Under the carpet

in that room, although it's not real noticeable if you walk in it, are gentle rises so that wheelchairs can get up to the first row of seats. But, that entire floor had to be re-poured to make it that way, and it's an expense. In University Hall 108 and Geoscience 100 when we rebuilt those, we actually made them accessible to instructors.

Now Science Hall 100 and 101 are as well. They can bring the monitor—it's on an Ergotron mount, and you can take that monitor and bring it down to this height [motions to chest height] and the keyboard [too], so that you can work in there if you're actually teaching a class, and you are in a wheelchair. I know for a long time, it was all about the students but, over the last several years it's about the instructor as well. What if you've got a teacher that comes in here in a wheelchair, what are you going to do about that? So they have monitors that are mounted low in those spaces and they're touchscreens. They're like 50 inch monitors. Everything that they do on there.... They can drive a web page, they can touch it, they can drag it, they can do whatever they want to with it, and it's all projected. So, they can do anything that an instructor standing at that podium can do, [but now] in a wheelchair in front of that, that board. They can highlight, they can circle, they can annotate, they can do anything there.

And that was kind of a big thing, and that was done probably—probably four years ago, maybe, and that was the first. Since then we've worked around, you know we have still have to work within the space, and we still maintain 3 foot clearance [for wheelchair users], 6 foot on a circle [for wheelchair users to turn around], you know, all that kind of thing. I keep my stuff out of 7 feet we make sure we've got cane detection or it's less than 4.5 inches, all those things are automatic now. But they didn't used to be.

### **Toepfer**

When you're when you're doing stuff inside a classroom and you're dealing with making sure everything's ADA approved, what challenges do you face, what are like the most obvious challenges that you have to go through?

### **Livingston**

<topic> Challenges with ADA compliancy </topic>

The biggest ones is the 4.5" inch requirement [barring protruding objects to prevent hazards to cane users] . If it's a low classroom like a basement classroom in University Hall, Trimble Hall, Preston Hall—not Preston, Preston has low ones anyway. The low ceiling classrooms, those are very difficult to hang a large projector and keep it out of the seven [foot] head height. A lot of people will tell you that putting a desk under that is sufficient, but it's not because a student has to stand under it when they get up.

That's probably the biggest one in the low classrooms, but in all of them any time you have like a smartboard, you've still got that clearance you got to maintain and then on top of the smartboards, projector and you still have that seven-o you got to maintain. In an effort to bring the technology in the classroom you still have things you have to maintain.

And so, you know, you kind of can fluctuate a little with the height but then you still have reach. You know, like if I'm sitting in this chair and I can't reach top of that board, it's just too high, especially if it's a touchscreen. So, usually if I get stuck, I sit in a chair, I put it there and I reach and if I can't touch the top of it, it's too high. You know of course if I'm really tall I'd probably be able to reach more, but I'm probably average.

But, it's not really a challenge, it's just a matter of knowing, going in, this is the way [that] this needs to be. And so when they start rebuilding spaces, Facilities has a lot of resources that they used to make sure this is following guidelines. And I think on almost every one of the projects, I think it's inspected by someone [a Registered Accessibility Specialist]. I'm not

sure who, but someone. And with the technology it's...we know what our parameters are when we go in, and if it's a low ceiling, we might have to get a smaller projector or a shorter mount or a different mount that tucks it closer to the ceiling. There are a lot of things you can do, and there's a lot of things that at the end of the day you just tell them you can't have that, unfortunately, because we can't meet ADA requirements with it. But the only thing I can govern is the 110 classrooms. Can't do everything. I can make strong suggestions everywhere else, and most of the time they're OK with it so I don't see it as a really big challenge, not today. There's too many, there's too many students [with disabilities] on this campus.

**Toepfer**

Who need to have that kind of access...

**Livingston**

Yes.

**Toepfer**

So, one of the things we've [covered in our Oral History Methods and Methodology class] is how in the '70s how UTA was becoming more accessible than a lot of other campuses already that early. Have you in your years working here—I know that is earlier than you were here—but have you noticed any particular reason early on that there were already a lot of....

**Livingston**

<topic>Impact of wheelchair basketball on accessibility at UTA</topic>

I couldn't tell you when the wheelchair basketball started. It was well underway when I got here, and I came in '86. That would be a date I would look up. Because if you're going to have a basketball team and they're all going to be in wheelchairs, you better make this campus accessible because they've got to go school here. And so, I don't know...I don't know Jim Hayes was the big driver in making this campus accessible. I don't know the history on the Movin' Mavs in its startup and how he managed to get that going, whether or not he was in basketball. You know, I don't know. I don't know, there's an instructor—he's in Kinesiology, he's in a wheelchair, he plays semi-pro wheelchair basketball, and I'm trying to remember his name, but he's the one instructor that we have on campus that I know is in a wheelchair, but he was kind of a big proponent for that too. [After the recording remembered it was Dr. Abu B. Yilla]

But I know that, like I said, when I came here they already had championships under their belt. So they were well-established in the wheelchair [basketball] world. So, that group had been here on this campus for a while, long before I came. And that could have been the driver for all that, even then. I know that it was Jim Hayes and that group, that one thing, and because they were National Champions especially since we no longer had football. Football went away right before I got here. They were like our claim to fame for a long time. And it's one thing—build it and they will come. I mean, you can't have them here and not have it where they can't get where they need to go.

**Toepfer**

So besides the infrared in the classroom, do you guys have any other future goals that you are working?

## Livingston

<topic> Video capture of lectures and closed captioning</topic>

Yes and no. I say that because there are as we go along there's going to be technology out there...The way our closed captioning works right now—just kind of a (swoosh noise) they run it [a classroom lecture captured in video format via the Echo360 service and made available electronically via a classroom management website such as Blackboard] through a machine, and the machine captures it. It does a decent job, it doesn't do a great job, it does a decent job, but, it captures the bulk of the text that's being spoken. Then they have a person listen to it, read the text, make the corrections, and then that in turn, that transcription, is what's closed captioned with the time stamp so that when the instructor is talking that particular text is coming up at that time. That's what creates a closed caption.

There are some apps out there that would do something similar to that. It's not ADA compliant, because ADA compliancy is 98 percent accuracy. These are not 98 percent accurate. They might be in the 90-92 percent range. I don't have a warm-body that can sit down and go through these and make all these corrections—it's just...it's [such] a time-consuming thing [that] I'd have to hire them simply to do that. But it's the thought that at some point the [lecture capture technology] group that we use, which is Echo360 on campus, will come up with something that will get us in the 90 percent range that we can offer everybody.

Now I don't have a date for that. I just think, in my opinion, in the future it will be there. Because they have now.... The group that we use, is the only group that's sanctioned by Echo360 to be able to capture their video. So they're aware that people need that service, and it's Cielo 24, I think. And so the fact that they have this group out there tells me that they're aware that their recordings are closed captioned which is why they had this group, and they give us a really good break. A lot better than what we were getting with what we had. So, I think that there's going to be a place here where there's going to be offering for that. There's that for the...and that would be for everybody including the people that English is not their first language. I think it would help everybody.

As far as the rest of it, the one thing that we got a big help with is [that] when we went from LCD flat panels to LED flat panels. We can get those within 4.5" inches [the limitation for objects to protrude from the wall without alerting cane users] and put them in any classroom we need to. And so, those are compliant as in of themselves because they suck right up, you know, close to the wall, which is kind of a cool thing. I think even if you're visually impaired, it helps if you've got a flat panel versus a projected image. At some point [we] will have Echo in all of our classes and, when we do that, closed caption ability will be everywhere. We've got it [Echo] in about fifty percent of our classrooms right now. But then, I wonder how Don...Don is our only lecture-capturer administrator, and I can imagine he manages a lot of classes now. I can't imagine you know having them all out there, we'd have to get him some help I think.

## Toepfer

With how fast technology changes all the time, do you...do you guys ever find yourself holding back on getting something in the classroom because there might be something six months later that would be better?

## Livingston

<topics>Evolving technology and predicting accessibility</topics>

We're doing that right now as a matter of fact. We currently have our projectors that we have in the classroom right now have lamps and filters. I want to go laser. Laser has no lamp, laser has no filter, but laser is brand-new. I don't want to be a beta test for anybody. I would like for these lasers to be out there for a little while and [to] be able to go out and Google it and say how did you like this? Did it work OK? Did it not work OK? With, I mean all of the brands, the ones that have been out there the longest is Panasonic, and they probably got

more experience than anybody, but they also cost the most. So, you pay for that experience of being out there.

There's...technology rolls really quickly. It's unfortunate that if we put some in a classroom today, it won't roll out for four years. So, for the first two years I don't even bother to look in to see what's out there because they're not going to give me the money for it anyway. To roll the equipment in the classrooms right now probably costs about \$1.5 million. You know, it's a chunk of change, and that's just for parts—that's not install—and we install that. That's to buy the projectors, buy the document cameras, and buy the PCs, and whatever cables we need to hook things up if they've changed signal. The next role will be to go from VGA to HDMI [video inputs] and so it goes. It's life and times in the big city. You know. It's just, it's money. It's a lot of money. And if we go this our technology and we start rolling this out in classrooms at some point it's going to have to be a technology that's going to be out there for a long time. And best I can tell, it's [laser] relatively new right now.

And so that's going to be my question to people that give me that information. How long has it been out there? And now looping has been out there for a long time. Because what they're doing is working with people that have a hearing deficiency or a hearing aid, and you have to think about the fact that the people who go to school here were not all born within the same ten years. Does that make sense? So you've got the ones that are coming out of high school and then you've got the ones that came out of high school had their families and then are coming back and their hearing aids maybe twenty years older then, because people don't change these hearing aids very much just because it costs so much. [Few hearing aids, if any, last 20 years. Average life expectancy is about 5 years. But, the level of technology varies widely among users.] And so, you have a range of hearing aid technologies out there that is going to be a hit and miss.

So we can put the...ours in there but you almost, you almost have to take their own hearing aid out of the picture and just assume they're going to take their hearing aid off, you're going to give them this receiver, they're going to put their ear buds in it, they can adjust the volume where they can hear it and call that done. It's just that you don't have a way of predicting what technology that's going to be. As hearing aids evolve then you've got the changing use in hearing aids. It's just...it's like two technologies that are almost at opposing views of each other. We're trying to put a single thing in place but then you have to get everybody on board. But who wants to go out there and spend \$5,000 to get a hearing aid just so that they can make use of this technology, when it's not the only technology out there?

So it's, it's kind of a...it's guesswork. At the end of the day, I can do all research in the world, but it might not work with this guy, and it might be fine for this girl or this guy. You know, this grandpa that came back to school again. That's the...that's what I have to convince the administration of, that we've got to jump off in there somewhere. You know we're not going to hit them all, but at least we have a solution that we didn't have before so at least without the FM systems and those are limited—I don't know how many of those that Penny [Acrey, director of the Office for Students with Disabilities] have over there. But, I mean they'll have to have the thing with this so even so. So, I don't know.

### **Toepfer**

What is one of your most proud achievements since you've been here? Whether it was when you were doing facilities or now?

### **Livingston**

<topic>Awards and installing PCs in all classrooms</topic>

There's probably two. Way back a long time ago in '90—so that was what fifteen, twenty-five years ago, I don't know—I won Employee of the Year, and I was incredibly surprised. I was

like, "Oh wow, how about that", then I was embarrassed. (laughs) I didn't like being center stage too much. In 2006, or actually in 2005, we were Classroom Support, [and we were] \$1 LERR fund [University of Texas Library, Equipment Repair and Rehabilitation Fund], that's the PUF funds [University of Texas Permanent University Fund], the University PUF funds which is library, equipment, I think it's replacement and rehabilitation—to bring technology to the classrooms on this campus. And that's the 110 classrooms, that's not the class labs or the labs, that's just the lecture classrooms.

At the time the total [number of classrooms] across campus was 178, I don't think that number's changed a whole lot. And what we did was we went and looked at all these classrooms. Some of them actually had technology in them. The criterion at the time was if it was three years old or older we would replace it. If it was younger than that we left it alone. If it did not have a PC we would put one in there. And if it didn't have a teaching station we would put one in. Because some of these spaces, they just use their laptop, it actually had something—not very many but something. And in two weeks we installed, ninety-eight classrooms and on the first day of school, they all worked, they all talked with the exception of one.

### Toepfer

That's pretty good.

### Livingston

No kidding. I mean we were running around because, you know, we've been telling the faculty that this was coming and nobody believed us. So they walk into their classroom, first day of school, and realize we actually did it. So not very many... Our utilization that first semester was kind of sparse.

Because a lot of these instructors, you got to understand—and this is not bragging actually it's sad that in 2006 we had entire buildings that did not have network in the classrooms—we had faculty on this campus that had never taught with a PC in the classroom. They had stood up there and lectured or used overhead transparencies. Or any number of things. But they didn't use a computer, they didn't have a projector, they didn't have a way to do that, and so they were intimidated.

You know they saw all this stuff, and then they were like "Well, are we going to get punished if we don't use it? Well, no." "We're trying to make your job easier here, you know." And there was a fuss for a while because they thought we belonged to the IT group (whispers)—they don't have a very good rep on campus—and you know they thought we were the opposing group that would put that in there to make their mark miserable. I went, "Look guys, I report to the same guy you do, the Provost. I'm on your side. We're not trying to make your life difficult, we're trying to make it better." It took a long time for that mindset to change. But when it did, it just kind of opened up doors.

We froze all of the PCs, and the people that had never worked with a PC in the classroom they're like "Well, I'm afraid I'll break it." [We said] "You can't. If you get in there and it locks up, hold down the power button till it shuts down. Turn it back on and do it again." I said, "This is really not very hard." And I said, "You're going to get this I promise." We held so many one-on-one sessions to get these people comfortable with this. The entire goal of that was if you learned how to work one room, you could work them all because they were all identical.

The touch panels and the X-panel the way they worked—you push "Projector" on in this room, it's the same button, same place in all ninety-eight rooms. That just eased this huge fear on campus that they would...because at the time if they changed a room from University Hall over

to Preston Hall, University Hall had an Epson, and the remote looked like this because they all used remotes, there wasn't any central remotes then their remote might look like this. But if they went over here and taught in Preston, they had a Sanyo projector, and the remote was different and they were afraid they weren't going to be able to find the right buttons.

This was just like a huge thing, you know, and this was in an initiative that set forth by Dana Dunn who was then the Provost, and Michael Moore who was the Associate Provost at that time. And, it's been a huge success, huge success.

We recently, I guess, probably...we bought the equipment three years ago. It's been out there about two and a half years now. We replaced all of the projectors that were originally put in at that time. They were all replaced. And we've got all new PCs, all new document cameras out there, and they're all the same. And now I'm looking forward to lasers. No lamps that we have to change, and they won't go out and everybody gets their stuff. Our job is to have 100 percent of the classrooms up 100 percent of the time. And we probably are pretty consistent about 98 [percent]. You know, it's only down for a few minutes if it's down for very long at all. It's rare that is down for the entire class.

So I think we've done a pretty good job myself.

**Toepfer**

Yeah, I would say so. Are there any final thoughts you had? Anything you wanted to mention?

**Livingston**

I think this campus is going places, I hope they just don't forget the folks that struggle harder than others to get where they need to go. We get so caught up in the 'R' word: research, I've always said that you can have all the scholars here in the world. But that students first day on campus is going to be in the classrooms, and they've got to be what they need to be in order for the student to want to move forward. So if you want a Tier One university, every space anybody walks into on this campus needs to look Tier One; it needs to act tier one. Part of that is being, you know, catering to all the people. Whether it's hearing impaired or English is not your first language or you know whatever it is you got to be there for everybody. It's hard to do that, but I think if you keep moving forward you keep striving eventually you'll have some success. If that makes any sense?

**Toepfer**

Well thank you very much for taking time out of your day to do this for us. I am really excited to transcribe all of this (laughs)

**Livingston**

Well, I'm a blabber monkey.

**Toepfer**

No, I'm glad. Thank you.