

Discussion 5

Everything Creative DESIGNERS

[BEGIN MUSIC]

NANCY HANSON (HOST): I'm Nancy Hanson, and this is Everything Creative. This program explores a wide range of creative ideas, talents, and experiences through interviews and group discussions. Join me today for a group discussion on creativity. [END MUSIC] Welcome back to Everything Creative. I'm Nancy Hanson, your host, and I'm excited about the program today. I'm here with three professors from BYU, who study creativity, and three graduate students. Let's go ahead and just get started with, with you, Rick, and then we will introduce the others as the program moves along. So, Rick, you did your dissertation on group creativity, is that right?

RICK WEST: Yes, I did, over at the University of Georgia. I just barely came to BYU, actually.

NANCY HANSON: Maybe you can just get us oriented and talk to us a little about group creativity and why you're interested in it.

RICK WEST: Yeah, that, you know, I became interested in group creativity. I started thinking about the kind of society and economy that we have now, and that we're moving into is computers and the internet changes the way we work and the way we, we learn, and I'm, I'm interested in that as an educator so I know how to best teach people to be ready to enter into society and be productive, and, and happy and those kinds of things. So I started looking at some of the, the trends we've, we've had in the hist-, in the past, and you know in the past we've had things like an agrarian economy where everyone's farmers, and we progressed and become an industrial economy. We were all, a lot of people were focused on industrial kinds of professions, and we moved into what a lot of people call the information economy, with all the information that was available on the internet. And I think we're moving towards a time now where, where the, the economy is really going to be focused on collaborative innovation, or group creativity, that ability to create ideas together with other people. And I'm not the only person who's, who's kind of thought this, we've found that, about, there's about a seventy percent increase in patents just in the last few years. So what companies are valuing now is people submitting a patent, and those kinds of things. And that's what's really the currency of the new economy. In fact, some people have said that the ability to work together with other people and come up

with a new idea collaboratively is the essential competence of our society now. And the new currency that we're dealing with in, in the economy. So, if this is the way we're moving, I started thinking, you know, well, what got us here, why is it that we got so much focus on working together as a group to be creative? Why is that the focus of our, of our society and our, our economy now? And I think there's a couple of things that kind of have led us to that point. First, you know, for the first time in history in the last few years we know have ubiquitous access: continually, immediate access to information all the time. And, back in 1950 there was a really famous psychologist and he, he saw this, and he said, "As computers grow and grow, and information becomes just free and immediate, it's going to get to the point where the only economic value that we have left is to create new ideas." Because who needs to remember anything when I can go on the internet and find the information as, as quickly as I want it. Now, we do need to remember things, that's part of being creative, being able to access information that we have, but the point is that information is free, so the value we now provide is, is being creative. So that's the first thing, the fact that we have ubiquitous access to information, I think, requires us to be creative in society. The second thing is we have ubiquitous, continual, immediate, nonstop access to people. I can pull out my cell phone right now and I can text, or chat, or email, or call any of my, any, anyone I know. People I haven't known for years I'm now connected with. And can email, and just like that. And, so I started thinking about it, well what kind of society comes from having c-, you know, nonstop access to information and nonstop access to people. And I think that's where we, how we got to this point, where what's valued now is working together with people because the communication is so seamless and so easy. And working together to create new ideas, because that's what we have to do, because the information is free now. So, that's, I think how we got here, and, and why I think we should be interested in it because, that's kind of where we're moving as a society, I think.

NANCY HANSON: Right. Things are so much different than they were. I mean, you know, and it hasn't even been that many years, and this kind of is a new movement, but is the way that things are going. So what kind of things have you learned in your research that you can use to help other people learn how to be creative and work creatively together in groups?

RICK WEST: Sure. So, a lot of what I do is trying to understand how larger groups of people, such as communities of people, or organizations, businesses maybe, departments, educationally or something like that, how these groups can be more creative and enable people to work together and be creative together, cause there are things you can do as an organization to either enable greater creativity to emerge from the group, or maybe to hinder it a little bit. And so what I've looked at is trying to understand what can we do to help organizations, groups of people, be more creative? And I think there are different things that we can do. For example, one thing that's important is having diversity. You know, bringing, uh, there's a, there's an industrial design firm out in, uh, California. And they bring together people like psychologists, sociologists, evaluators, teachers, CEOs, engineers, they'll bring all these random different kinds of people together to, to solve a problem, and they're very successful that way. So having diversity in the kinds of experiences we have

lends itself to group creativity. Also, allowing people to have autonomy and kind of ownership over their own work is, is a different trend from what we've seen in the past, where, you know, people say, "Well you've got to do this, do it this way," and then the industrial economy now we're saying, "No, do something that you think is important that solves our company's mission, but, you know, take ownership of yourself." And that's actually another important part, is people tend to be more creative when they enjoy what they're doing. They're doing it because they enjoy it, they're emotionally invested in it, so that's another key too. And it, and that helps with that. But if you can let people kind of work on what they're, what they're naturally strong at.

NANCY HANSON: And you feel so good when you've, when you're creating something, or when you have created something and you look back at that and go, "Wow, that was a great process." You know?

RICK WEST: Right, and it does motivate you want to keep going, because you do feel like you accomplish something. You know, another thing is, is feeling like you got, one guy called it "psychological safety," just basically feeling like you have a sense of trust with the other people in the organization, that you can trust them with your ideas. And criticism is important, you know, getting feedback on your ideas, but that criticism is going to be constructive, it's going to build you up. And I found also in some research I did recently that people learn by giving criticism to other people. And when I say criticism I mean like, not a mean critical, but I'm giving you feedback. And so I, someone would give feedback on someone and say, "By giving you feedback I learned about something I'm doing too, that I need to do better in my own project." So, so that kind of, having that kind of an atmosphere where you can share that, and being able to reflect as a group and learn from your past mistakes, you know failure is part of creativity. Being able to reflect and learn from your failure is how we can be creative as groups and teams. So, I think those kinds of things are important. Another that's important is groups that are, and organizations that are creative are more dynamic and changing, you know it used be you'd have, you'd get into a profession and you'd do the same thing every day for thirty years, and that's not the way it is anymore. So this idea of being able to adapt and change and say, "Well, yesterday I used to be an engineer, today I'm going to be a psychologist, cause that's what I need to do for my team, to help my team be successful, or I'm going to learn a new technology, or I'm going to learn a new subject, so that I can contribute to the use of," so constantly learning and gaining new skills and new ideas is important.

NANCY HANSON: So that makes me think that, it's probably, you know, kids, young kids in elementary school and stuff have to kind of start learning a different way, because the world is changed. And they're going to need to develop those skills, you know, to be able to fit in.

RICK WEST: Yes. I, I think you're right, I think that unfortunately, and there's been people talked about this, but unfortunately, I think the ways schools are structured, they're structured kind of more for an industrial economy: to teach people to do a particular thing, and we almost need to think about how can we structure schools and education to help kids be creative? It's interesting, but kids, they give them creativity tests, and they're super creative. Until about third grade, and all of a sudden it just drops. And the creativity is just gone. And that's a problem, you know, stressing that's important nowadays, so.

NANCY HANSON: Oh, it kills me.

RICK WEST: So, I think, somehow being able to, to help, you know, yeah in education, be able to create these kinds of group creativity experiences in classrooms. Have your classroom be a community that can be created together.

NANCY HANSON: And that just becomes part of the way that you think, yeah.

RICK WEST: So anyways, so those are some of the, some of the things that I've kind of looked at, and I know that Peter here has, talked, thought a little bit about what kinds of things maybe, make it difficult for groups, and teams, and people to be creative.

NANCY HANSON: Why don't we...

RICK WEST: Cause that can be a problem, too.

NANCY HANSON: Peter, why don't we have you introduce yourself, and let us know a little bit about where you fit into this whole picture.

PETER RICH: Okay. I also went to the University of Georgia for my graduate school, and they have a center for creativity there, and I've done a lot of research there. And, probably one of the most favorite classes that I ever took was a class in applied creativity for teachers. And so instead of studying about creativity, and the background and the history of it, we studied ways to foster creativity in the classroom. And it was one of the most eye-opening experiences I've had. It had nothing to do with any of my other research, and any of my other studies, but it was probably the best class I took because of what it did to me. It was a way to practice creativity, a way to learn how to be creative, and so one of the things

that I've made sure to do here at Brigham Young University is to offer up another class in applied creativity, especially for instructional designers. And so, we focus on design challenges and how we can use other people's creative methods to solve those design challenges. For example, we have a friend who now works at the CIA and is Director of Learning, and one of the challenges that they have is training their spies, because their spies are spread all over the world. And they need to have an online system to track the training of their spies, but the problem is they can't identify who the spies are, and they can't identify where they are. So they have this difficult design challenge that they have to come up against and somehow solve. And one of the things that often gets in the way are barriers that we put up. And these barriers are put up by ourselves. So I think it's important first to understand some of the things that get in the way. If you've ever heard, here are some phrases that people say: "That's too modern." "That's too old-fashioned." "We're not ready for it yet." "No way, are you nuts? Oh, it's a waste of time." "That makes no sense!" These, these are things that people say all the time, and so, there's several different types of barriers that get in the way. If we were to look at some, probably the first is habit, and learning. Habits are good. They give us ways of going through the day; they get us ways of creating order in our lives. But sometimes they get in the way as well. There's a thing called functional fixedness, which is where we see an item, and we only see it for the use that it's meant for. In my class in educational psychology, I have my students learn about functional fixedness. I give them, a situation where they have to, they're given a box of matches, a candle, and a tack. And I ask them to be able to put the candle on the wall, and light it, so that it can actually give light to the wall, and give light to the room. The first thing that most students want to do, is they want to take the tack and they want to stick it through the candle, or they want to melt the candle. They do the things that you typically think of. And so, functional fixedness is getting the idea that, take something and look at it for a use that it's not meant for, getting over that idea. So, that's one of our first barriers that we have to get over. Another barrier is the idea of rules and traditions. Rules really get at the idea of hierarchy. Well, this is the way that it is. And, I mean this with all due respect, in the Church, often people have certain rules. And there are rules in the Church handbook that are written and those rules are important. And then there are rules that are just part of the ward that you've been around for a long time. And sometimes you get into position in the Church and they say, "Well you can't do it that way. It has to be done this way." And when you start digging and finding out, "Why is it done that way?" it ends up that it's just always been done that way. This is tradition. And the Church, I can't remember who the first person was that shared this story, but the story of the turkey and why it was cut going into the oven.

NANCY HANSON: Yeah, I heard it told about a roast.

PETER RICH: Yes!

NANCY HANSON: Yes, it's that same idea!

PETER RICH: It's that same idea!

NANCY HANSON: Just the way it's always been done. It's the way my mom did it, isn't that what you're supposed to do? Yeah.

PETER RICH: Exactly.

NANCY HANSON: And there's no real reason behind it.

PETER RICH: Or there originally was a reason, but the reason's been forgotten. And, the idea behind the roast for those who are unfamiliar with the story, is there was a daughter who always slit the, a mother who always slit the roast when she put it into the oven. And the, her daughter looked at her doing this, said, "Mom, why do you do that?" And she said, "I don't know, my mother always did it that way." And so, she went and asked her mother. And her mother didn't know either, she said, "My mother just always did it that way." So she went and asked her mother, and she said, "Oh, well had to do that because the oven wasn't big enough for the roast to fit in.

NANCY HANSON: (laughing)

PETER RICH: And so, the, the reason for doing it originally was, was actually a solution to a problem that they had, but that problem has not gone away. And sometimes rules and traditions get in the way of us being creative. Another way is perceptual barriers. And these are just things that we think, they just can't be. It's wishful thinking. It's, they, they prevent us from seeing the real problem, and things as they are, from seeing now applications for things that we've already done. And so, if we can just get over our perceptions of, "That can't be that way just because it can't be that way," then that's a big step already. If we say, "Well, we can't fly because men can't fly. We can't fly because, or we can't breathe underwater because people can't do that." Those are just perceptual barriers, and "just because" is one of the biggest barriers to us just being creative.

NANCY HANSON: Right, you just have to open up, and anything is possible.

PETER RICH: Yes.

NANCY HANSON: Yeah.

PETER RICH: I have to remember that as a parent as well, when I'm telling my kids why, "Why can't things be this way?" "Just because."

NANCY HANSON: (laughing)

PETER RICH: So, a couple of the other things, really quickly, barriers that we have are cultural barriers. It, cultural barriers have to do with the society in which we live and more often than not, there are ways that we think others think we should behave. So it's not necessarily that it's a rule, or it's a tradition, it's just what I think you think I think. And if we can get over these cultural barriers as well, and stop thinking what others think we should think, we'll be able to think better. (laughing) So, I don't know if any of that makes sense, but just the last couple of things. Emotional barriers, sometimes we're really attached to things, or we have anxiety about doing something. And those emotional barriers as well will stop us. And the last barrier kind of seems like an obvious one, but sometimes it's just a matter of resources. If we don't have the resources to do something, than that often stops us from being able to get at it. And this, where Rick was talking about, learning new things. And Stephen Covey talks about this in his book, Seven Habits of Highly Effective People, when he talks about the ability to play the piano. It's a trained ability. And the Church teaches us to learn and to always be learning new things, that's a resource issue. If I don't have the knowledge, if I haven't learned something, I can't use it to do what I want. After taking this creativity class, I started keeping a notebook of ideas, and I came up with all sorts of ideas. And I think a lot of people do, for things that need to be done. But I'm not an engineer, and so there's a lot of stuff that I need to learn in order to put some of these ideas to practice. Which is why, and many ways I've hooked up with Rick and with Geoff over here. Geoff's in Technology and Engineering Education, and he's been great for me to hook up with because it's another field, they've got other resources, and the tools to do a lot of the things that I personally would like to do.

NANCY HANSON: Yeah, and that's why that collaborating works, where you may have the idea and someone else has those resources. Yeah. Great.

PETER RICH: Exactly.

RICK WEST: Geoff here is a professor at BYU too, and he does a lot with teaching students, particularly your students that need to be creative in their chosen fields of study. And he does something to help them with that, and he's going to guide us kind of in a little bit of activity with that. Want to explain a little bit more, Geoff?

GEOFF WRIGHT: Sure. First I should probably introduce myself. My name's Geoff Wright and I teach Technology and Engineering Education, which is in the College of Engineering. And within the College of Engineering, you have obviously the engineering degrees: civil, chemical, mechanical, electrical, but you also have this thing called the School of Technology. The School of Technology has Facility Management, Construction Management, IT, ID, which is Industrial Design, TE, Manufacturing, Engineering, Animation, and I think that's it. There's a, there's a big group. And the thing that's interesting about the group is everyone has an expertise that is actually very different. The college looked at that and knowing what Rick introduced earlier, that the, our economy, the current currency really is innovation set in initiative. And one of the initiatives in the college of engineering is innovation. Which fits nicely with Rick's research on creativity. With this initiative, the college asks a group of professors to get together and come up with a solution of how we can help our students become more innovative. And we wanted to teach them processes and principles of innovation, creativity, while they're early in their engineering degrees so they can apply these principles later and cap some projects into their classes. As a committee of professors we travel around the United States and ended significant, significant research in different areas, and we went to IDO, and the Stanford School and so forth, and talked and observed with them. And ultimately we came up with a solution, we titled it, we titled it the innovation boot camp. And the word boot camp, I'm sure, has a scary connotation, but-

NANCY HANSON: Yes, it does. (laughing)

GEOFF WRIGHT: For our students, it simply was a workshop, an intensive experiential, hands-on based workshop where they're learning and practicing innovation. It was a two day event where we invited students from each of the different areas within engineering to participate in this class and work with professors side by side on the principles of creativity and innovation. Ultimately, we've gone through twelve iterations and over two-hundred students have gone through this, this boot camp. And today, we're going to do a mini-boot camp in the next few minutes with these Instructional Psychology and Technology graduate students. And in doing so we'll introduce you to the principles that we're currently using in the boot camp.

NANCY HANSON: Great, that's so exciting! Cool. Ok, so, why don't we introduce our graduate students, we'll just go ahead and start with you, Shawn.

SHAWN CATES: Ok, I'm Shawn Cates, and I'm, I'm a masters student, and I've been in the program for about a year.

NANCY HANSON: What school?

SHAWN CATES: In Instructional Psychology and Technology. My undergrad background is in biology.

NANCY HANSON: Dan?

DANIEL RANDALL: I'm Dan Randall, and I'm actually just starting the instructional psychology and technology program, for masters. And I was actually teaching history before, and it's kind of interesting because what really got me into this is I said, "You know, I see the problems my students are having in trying to learn history, but I don't have the tools to be able to create what they need." And so, just like we were talking about earlier, that kind of brought me into this, to provide me with those resources to be able to create something to help my students.

NANCY HANSON: Wow, great. Anne?

ANNE MAKIN: My name's Anne Makin, and I'm in the instructional psychology and technology PHD program. And my background's in elementary education, and I got my master's in school psychology. And so I've, I definitely agree with what Dr. West said about, that by third grade we've kind of suppressed a lot of this creativity, and if our currency is innovation right now, we should be facilitating it. So, I'm excited to participate in these classes.

NANCY HANSON: Yeah, so interesting that you all come from a different place, you know? So cool. Ok, so how's this going to work?

GEOFF WRIGHT: Ok, so as you look around the room, this room is now littered with different types of bottles. One of the first principles of innovation, now I should mention that these students

here have never heard of this process of innovation, it's something that we pulled from different resources in the college of engineering, and so this is new to them. So this is sink or swim time, a good moment of evaluation for this process. But anyways, the first principle of innovation is observing or observation. And it's where you do careful scrutiny of your surroundings or things that you interact with. Peter Rich, Dr. Rich next to me, he calls it your pet peeve list. Where you're, you're noticing things that might just not work or that bother you. We also call them compensatory or deviant behaviors, things that you, you're making up for the lack of a design, or as service, or a product, and so forth. So, we kind of went through the observing phase when we had a meeting the other day. Rick, did you want to weigh in?

RICK WEST: Are you going to, are you going to tell them the problem, that we...

GEOFF WRIGHT: Yeah, we're leading right to it, yeah. (laughing) So we had a meeting the other day Rick, and Dan was there, and Peter. And we were talking about different things that have issues. We've asked each of the students to select one of the bottles or the containers that we have lying around this room. And we even noticed that Nancy had one in her, her purse here, cause everyone drinks water, or carries some kind of liquid on them, or at some time during the day will be drinking liquid. I brought this, they've redesigned their bottle here, and they have this new top on it where you have to peel back a tab, and it takes two thumbs to open it. You know, my children, they take it and they can't open it. And so I have to take it and they'll use their teeth and bite on it, and they can't. But this is yet their new design they came out with, you know, a year and a half ago. It's problematic because it's hard to open, but it's helpful because the cap stays on. You can close it and so forth. So each of the students has a bottle, and today's challenge we're going to go through redesigning the water bottle, specifically the opening so we can have a more efficient and effective method of drinking and then resealing the, the drinking product that you're using. So Peter's going to talk about his real quick, and a few others are going to weigh in, and not take too much time.

NANCY HANSON: And just to give a little perspective to our listeners, you know, you, you walk in this room and you see all sorts of little containers from Sippy cups, to aluminum cans, to...

GEOFF WRIGHT: Right, so around here we have several pairs, we have Sippy cups, some modified Sippy cups that we've, you know, cut open so that the orange juice will flow more freely, we've brought in different soda cans, we have biking water bottles, and we have a syrup container, we have the kind that you, you know the big jugs that you see truckers, not to, you know, generalize, but they usually have these big, you know, containers, So we're going to, we're going to draw upon our experience and our observations of using different drinking devices to help redesign.

PETER RICH: Ok, so the bottle I have here is a water bottle that has a lid that screws off in two places. And the thing I like about this is it's got a smaller opening that I screw off to drink from, cause when I drink from the bigger opening, it's like, you know, runs down my cheek and everything. I think, better people can drink from it without making a mess, but that's not me. But the think I like about having the two openings is, the bigger opening allows me to put ice into the water bottle, and I imagine that's why they did it this way. The problem that we have with this water bottle is because it has two openings, it has more places to leak from, and it's got no rubber seal on it anywhere. And so even though it's, it's a good design, it's actually bent in the middle so that it fits your hand really well, and it's got a nice little loop on it so that you can carry it, we end up not using this water bottle as much as we'd like because it leaks on us.

NANCY HANSON: It leaks.

PETER RICH: Cause the extra openings.

NANCY HANSON: Ok. Shawn.

SHAWN CATES: So my water bottle is a little screw-lid water bottle that looks like the business plan competition gives out. And some of the problems I noticed with it, is it doesn't seal very well. Someone with smaller hands may have a hard time holding on to it. I'm, I don't know if it fits in a cup holder. I wanted to test that, but wasn't able to, but I have my doubts there. It does have a wide mouth, which, which has some benefits and some drawbacks; you can stick ice in there but it makes it hard to, to drink from in some situations. It's pretty small, it's not going to hold a lot of water, and it doesn't have any kind of insulation if you want to keep it cold or warm, I don't, I don't think you're going to be able to do that for very long. So, that's what my bottle's looking like.

RICK WEST: And you know, and one thing I, I have bottles like yours, too, Shawn, and, and you've got a, something that holds around the mouth of the bottle that holds the lid on. Like a little rubber thing, you know.

SHAWN CATES: Right.

RICK WEST: I always hated those because when I'm drinking, the lid then is smacking me in the forehead, as I'm drinking from the water bottle.

SHAWN CATES: Yeah, yeah it does. Tends to come back at you a little bit.

RICK WEST: Pet peeve there, yeah. Well I've, I've got a water bottle, one of the pet peeves I have with water bottles is that, um, the kids will take the lids off and then lose them. And we'll have a bunch of water bottles without lids, and so I found this the other day, and it's, it's got a lid that screws on, but then once you've got it screwed on there's a twist part of the lid. So you just twist it up, and then you can take a drink, and you twist it down and it's closed. So the nice thing about that, is the lid is never lost, the problem is you can't get very much water out. It's probably good for kids, but anybody that's, you know, if I was out running and I was really thirsty, I wouldn't get more than just a couple gulps out of this, it's really hard to drink from. So that's the problem I'm having with mine, and, I like the insulation problem too. That's one of the problems I have with all water bottles, is you can't insulate it, they get hot in the car, and they're, they're a problem that way.

DANIEL RANDALL: So, the bottle that I have is a reusable sports bottle, and it has the large open-up mouth so you can screw the cap off, get your ice in. But on the cap it also has a smaller opening so you can drink from it without making a mess, and it's kind of interesting that the cap for that is actually hinged on the lid itself, and so you don't lose the cap and you can easily put it back down. The problems I'm seeing with this is that the hinge doesn't open very wide, so it's going to get in your way while you're trying to drink, and it's kind of difficult to tell if it's closed all the way. You have to make sure it (snaps lid closed) makes that snap. Otherwise, if you think it's made the snap and you put it down, you're going to have a leak, and that's kind of the problem I'm seeing here.

RICK WEST: I think that hinge isn't going to last very long, either.

DANIEL RANDALL: No, yeah. (laughing)

NANCY HANSON: Ok, Anne.

ANNE MAKIN: I have a Sippy cup. You typically buy them for toddlers, and this one in particular's pink. But it has a rubber top, and I want to say the receptacle, the receptacle where they sip from has little slits, just two. And I, I believe the purpose of this is so that when the toddlers set down their Sippy cup, it doesn't spill, spill it out. And it usually functions quite well for that, until they've chewed it to the point where it's open all the time and it still spills. So I see that as one of the problems of the Sippy cup. I've, I definitely like it

initially, that it doesn't spill, I also feel like it has a curved, the body part, is that what you...? Body part. (laughing) It's curved so that little hands can grip onto it. It has little grips. And, so, usually they're able to hold on to it quite well. The things that I don't like is if you put orange juice in the Sippy cups, especially orange juice that has pulp, it gets stuck in the little holes. And so then you have upset toddlers that can't get their orange juice. And so that's, that's always disconcerting. Another thing is, is these Sippy cups you really have to make sure that you put them on directly and twist them exactly or else there's a break in the seal and they usually end up spilling anyway. And so those are some of my main concerns, oh, also another concern is, a lot of times when there's not very much left in the Sippy cup, they have to tip it up. And, especially as toddlers are learning to walk and things like that, tipping the bottle up to get some, get some of their drink puts them off-balance, they don't like doing that. They usually think it's all gone, anyway. (laughing) If it's if there's just a little bit, so those are some things I've noticed about the Sippy cup.

GEOFF WRIGHT: Well, thanks for sharing. One of the primary parts of observing is this active observing. And that's when you look at something and, and you experience it, you, you go test and it out and you say, "Ok, what was different than it was, than what was expected." For example, we'll send our students out in wheelchairs around campus and they'll have to go check out a book, or go order food at the Cougar eat and so forth. And, and they'll have some students taking notes and watching them, but also then they're in this, this role of empathy. Where they're learning what someone in a wheelchair might experience. And they'll, they'll take notes and think, "What was different than what was expected, what are some of the issues that they're dealing with?" And so typically we have everyone use all these different types of bottles and experience them so they can have a real observation. Let me flow through the next principles so that as we go to them, we can go quickly because of the, the time constraints of this show. The next phase would be questioning. And that's where you experience it, and you, you start asking these questions; there's two primary questions: "Why" and "What if?" "Why was it designed like this?" if it's a design issue, or if it's a service issue: "Why is this functioning like this, why is this done this way?" And then you ask the same question: "What if?" "What if it was done this way?" And this is where you start getting into the process of innovation creativity, because you start questioning your observations. The traditions, like Peter was, and then the culture issues and the various barriers that Dr. Rich mentioned. The, the third step is then, leads into associational thinking, where you, you look at seemingly unrelated fields or issues and, and use those fields to push your understanding and creativity of how to solve the problem you're dealing with. And we'll do that in just a second so it makes more sense. The fourth area is idea networking. And this is where it's exciting, cause one of the issues and one of the things that Rick talked about was, was resources. How do you, how do you tease ideas from various areas? And Ideo was a great example of people, of a company that does this because they have, you know, a guy that was doing Pre-Med that went to work for the company, they have a psychologist. They only have one industrial designer on any team at a, at a specific time, usually. They have people from biology, and engineering, all working together as a team is because everyone comes with different experiences, a different set of resources, if you

will, because they have life experiences, they have different learning backgrounds, degrees, and so forth. And with that, with those eclectic mix of ideas they can come up with something very innovative and hopefully more efficient and helpful. And the final principle of innovation that we teach in engineering is experimenting. A lot of people associate this with prototyping. Prototyping is limited usually just to the development of a service or a product, or a system if you will. But we like to focus not just on the development of the project, but showing, telling, and acting it out. So today should be pretty exciting, Nancy, because we're going to have the students act out, on radio, with their new water battle looks like. And then how it functions.

NANCY HANSON: (laughing) That will take some creativity in itself!

[LAUGHING]

GEOFF WRIGHT: All right, so to continue on we'll go right to the questioning phase. So, we didn't do as much observation, but we, we need to flow through this. Questioning: so "Why" and "What if." So, everyone has paper, but this is an open dialogue, and you want to write down and talk about questions of "Why" and "What if" your water bottle was designed differently, or why it was designed the way that it was. Rick, did you have something to weigh in?

RICK WEST: Dan, tell, tell them what you were telling me about, "What if the water itself was different?"

DANIEL RANDALL: Yeah, well I was noticing, as I was getting ready to come here this morning I was washing my hands and I was just, thinking about soap bottles. There are lots of soap bottles in my bathroom and I'm like, "You know, there's nothing really fancy about these lids, but you don't leak too much and that's because of the consistency of the water." And I thought, "You know, maybe what the, the key here is to actually change the consistency of the water while retaining its ability to hydrate you. And (laughing), if we could actually—

NANCY HANSON: That was thinking out of the box, right there.

[LAUGHING]

DANIEL RANDALL: Exactly, that's thinking out of the bottle there. And so—

[LAUGHING]

DANIEL RANDALL: If you could do that, the, the lid wouldn't be as much of a problem, it would, because you'd actually change what's the real problem, is the water.

GEOFF WRIGHT: And that brings up a good point. Usually we talk about this next sub point, if you will, in, under associational thinking, but deferring judgment is a huge part of creativity. You know, so, yeah...having liquid that is a little thicker. You could laugh at that, which we, we did (laughing), because it's a funny idea, but that's, that's part of creativity. You want every off the wall idea that you can imagine written down. And so in our classroom we'll have huge whiteboards for all the students and every idea they'll post the pictures and the videos that they've taken of their observations up on the wall and start writing down idea that has to do with it. And that's part of associational thinking and idea networking. But also questioning, cause "why" and "what if." What if it a thicker water? Defer the judgment, write it down, cause who knows what it's going to lead to, you never know where creativity's going to come out of.

PETER RICH: That reminds of, a chemical company that was trying to figure out a way to improve their products. And someone said, one of these crazy ideas that they weren't allowed to criticize said, "Well, what if the paint blew up?" "You put it on the walls, and it blew up the walls," and "Ha ha ha, that sounds really dumb." Out of that idea came the idea of putting a latent chemical in the paint that when mixed with another chemical would dissolve the paint on the wall. So there, that actually now chemicals in the paint that become active when mixed with paint removers, and that makes it come off the wall. And that came out of the idea of, "Let's make the paint blow up."

GEOFF WRIGHT: So, let's take a minute now and just write down and think about and discuss "why" and "what if" questions.

RICK WEST: Well, what if we could do a, a, a lid that screwed open like this, but was a bigger mouth? Cause I think a lot of us like the bigger mouths, but the screw idea was a good idea, so if it screwed but was still a big mouth at the top.

PETER RICH: Why on the Sippy cup is it made out of rubber?

GEOFF WRIGHT: And you're part of the group now.

NANCY HANSON: Great. (laughing)

RICK WEST: What if it could be flexible, but, but not break down when kids bite it? What if it was like a tougher rubber, or something like that?

ANNE MAKIN: Well, and to answer that, as far as why, I'm pretty sure it's so that it can close once they take their mouth off of it. So...

RICK WEST: What if it closed by itself, like my computer?

[LAUGHING]

RICK WEST: You know what I mean, like the, it opened up, and then when you took your mouth away it just closed.

ANNE MAKIN: Well, I almost wonder if, like, even some heat sensor.

RICK WEST: Heat sensor, yeah.

ANNE MAKIN: Or something like that, the temperature of your body...

RICK WEST: ...opened it up.

ANNE MAKIN: Mmhmm.

PETER RICH: They do that on computer stuff, has sensors now to sense where it's at on your body, so if we could do the same thing with temperature, don't flowers do some... Flowers turn towards the sun, and they're obviously sensing the heat in some way. Would there be a way to include something like that, the ambient temperature of your mouth?

[LAUGHING]

PETER RICH: My braces that I have on right now are, are heat activated. They, the heat in my mouth makes them work, harder. And when they stop being effective, when they've done their job, the, our orthodontist puts in another one that's going to be heat activated now.

GEOFF WRIGHT: So part of questioning is doing this like root-cause analysis. And see you think back, what, you know, what was your main pet peeve with, with, with the, the design or product that you're, you're considering? So you're really, we really want to find the right questions to ask about the product and that, the "why" and the "what if" will help, but sometimes you don't, you won't come up with the right question right away. And that's when you get to associational thinking, that might promote a greater understanding in further creativity.

RICK WEST: What if we could design the bottle itself so it didn't spill if it was tipped, but would let you drink from it, I don't know how that would be, but, just design the whole bottle differently, I don't know.

PETER RICH: Well, the purpose of disposable bottles is to have quick access and portable access to water, and then to get rid of it. And, not that I want to promote more littering all over the world, Shawn, I know, that's about just you have a problem with that. But why in the world does the lid need to even come off? Why can't it be put on, have the water put on, then have it put on and fused on in order to create maybe a single piece...

PETER RICH: ...or the bottle so that then, you get rid of it that way. And maybe there are fewer moving parts.

GEOFF WRIGHT: So you're talking like a Ziploc drink?

PETER RICH: Uh. Yeah. I'm, I'm yeah.

GEOFF WRIGHT: Maybe. Something like that?

PETER RICH: Yeah, something like that. Kind of when we were talking earlier, I was thinking about our swimming pool, and when you blow air into the swimming pool, it's got the, it's got the, the, the opening that you blow into it and it's stopping air from getting out, and air escapes more easily than water, and the, the only thing that they do there to stop it is just, you bite it with your teeth. And then you can get stuff in, but as soon as you let go it automatically closes, and maybe if we had something like that. Maybe the problem is, the problem is the way that the lids are going onto it, not so much the way that they're opening but the way that they're going on.

GEOFF WRIGHT: I think what I'm noticing here, is without actually going and observing people drinking from the bottles, we're, we're, we're drawing upon previous experience. Which is great, but I think active observing is interesting when you go and, cause we have different audiences that we're dealing with here. We have the younger children, we have adults who're trying to put ice in there, or when they're running, and so forth. So I think some of it has to do with our audience analysis and understanding who we're designing this product for. If it is going to be disposable and have water injected, or if it's going to be a refillable bottle that you're taking the Nalgine top off and on. So that's part of the observing. But I think with the time constraints, unless someone has something else to say let's go to associational thinking so we can kind of define for the audience what this principle is all about.

GEOFF WRIGHT: So our design challenge, then, will be the disposable water bottle. So that's what we're going to focus on. And, for adults. Or any children will use this as well, but. Ok, so associational thinking, this is, there's, there's several different ways to go about associational thinking. It's again relating seemingly unrelated fields to the issue that you're dealing with. The diff—we have different activities that we do, but the one activity that we're going to do today is, you can see on this chart over here. Peter can you read the different categories for us? Of occupations that we're going to use to help you to find the problem and come up with a solution.

PETER RICH: A journalist, fireman, psychologist, baker, landscaper, mechanic.

GEOFF WRIGHT: We're going to have everyone choose two. Two of those occupations and you have to think of those occupations in ways to help them solve the disposable water bottle problem. For example, in my younger years I worked as a fireman. There are fire hoses, we used to have to carry the, the hose on our back, we had these, these pumps that we'd carry on our back. And so something, some of my experience or something I've observed

will help me come up with a creative way to, to address this problem. So we'll take just a minute to think and discuss about that.

RICK WEST: Well, what kind of fluids do people use in mechanics, and as landscapers?

DANIEL RANDALL: Well, one thing that I was thinking...

PETER RICH: Water.

DANIEL RANDALL: Yeah, you use a lot of water, but. Well, with mechanics a lot of times you have a lot of fluids moving around and usually there are pumps, a lot of pumping systems. And so I don't know exactly how that would play into a water bottle, but, some type of pump could be...

GEOFF WRIGHT: Yeah, you have water pumps, fuel pumps. Yeah, you have your windshield wipers that are spraying liquid, you have, and you know, your radiator. You have all types of, that's a great association of thinking.

RICK WEST: Association of flush, for our water bottle? Like, flusher water bottle system?

[LAUGHING]

GEOFF WRIGHT: But no, that's interesting cause you've seen water bottles that are divided up in, into different parts. And so if you had the way to pressure once, if gravity could pushing the one liquid up around to the other side, yeah. If you had your water bottles so that you have this, this gravitational pump flowing up, the liquid out. That's a good idea, to push that?

PETER RICH: And maybe you do want it to flush, you won't backwash.

[LAUGHING]

ANNE MAKIN: I think that could solve a problem, because a lot of germs get stuck in the lid, especially those pull-up lids, if you're reusing them over and over again.

PETER RICH: Oh, exactly. That would be great.

ANNE MAKIN: Yeah, if you were able to flush that out...

GEOFF WRIGHT: Yeah, so as you, as you drink and pull it would be pushing, it would be pushing the valve down, and forcing the water to come out. So that, that's an interesting idea, yeah.

PETER RICH: So, instead of sucking, maybe, from now on to drink you blow, and then it...

[LAUGHING]

GEOFF WRIGHT: Who knows, defer judgment, you know. Sometimes I don't want to defer judgment, but this is one of those...

[LAUGHING]

GEOFF WRIGHT: Alright.

SHAWN CATES: I'm just thinking about the baker, too. In baking you have yeast that'll, that'll rise when things get warm. What if you could have an insulation material on the bottle that would activate when it got warm and rise or something and keep your bottle insulated?

GEOFF WRIGHT: Yeah, that's a great idea.

PETER RICH: That would be great.

GEOFF WRIGHT: In fact, that's a good associational example, with the jackets that were developed at BYU. Do you remember those? So, there's this new ski jacket that came out that they're putting in argon, you know, it's inside of the COT, CO₂ capsule. And you put it on your jacket, and so you, any temperature that you're out in, you can adjust the dial and it puts argon into the jacket. I believe it was argon. And then, you know, if it's below zero, turn it up a little bit, you know, if it's thirty-two then turn it down.

RICK WEST: So if it was, yeah, had it have a little knob.

GEOFF WRIGHT: And they got that idea from SCUBA diving. Cause that's what they do for, for dry suits. So, yeah, that interesting. The yeast idea is a really good idea, that's interesting. Or baking, how about, you know, pastry chefs when they're doing cakes and they're squeezing out the, the icing. There's got to be, you know, there's the squeeze function there. I haven't seen a lot of disposable water bottles that are squeeze bottles and that. Kind of like a toothpaste thing where you would roll it up and once it's done, it's done.

RICK WEST: You have less waste that way, too.

GEOFF WRIGHT: Less waste, it's already, kind of in a compact

Compact, or maybe it's biodegradable or something.

You know, the thing about firemen, in the hoses, with the pressure. What if you could have a little bit of pressure in your water bottle, not a whole lot (laughing), but so when you drank you got more water out because there's a little bit of pressure just pushing a little bit more water out? So instead of having to (sucking noise) suck, like we always have to when we're drinking, you know, it would just kind of flow. Just flow right into your mouth. Pressure.

GEOFF WRIGHT: Yeah, yeah, yeah.

PETER RICH: Well its funny cause talking about pressure in landscaping as well, you actually have to be careful of the pressure in your pipes. Cause you don't want any pipes bursting. And the same thing is true with, like a jug, at the top. Problem is that you suck on the bottles and they go (makes noise) and crush up as well. Maybe you don't want that crushing up, and so, the way they solve that is by having another air intake somewhere, and so.

GEOFF WRIGHT: Oh, yeah. That's a good idea because on the old packs that we carried in firefighting the pump would come out of the bottom, because gravity's pushing it down. So why do we always drink out of the top of the bottle and not out of the bottom, where gravity's forcing the liquid down. Why is the, the nipple or the opening not something that closes in itself? You could, it would have a little drainage, like a, a pea trap down at the bottom. And so you could be pulling liquid in that way. That's interesting.

PETER RICH: We really are drinking from the bottom, cause you always turn it.

GEOFF WRIGHT: You always turn it up, anyway.

RICK WEST: But that's difficult, especially when going, I know where folks, you know adults, but especially children who can't lift the water bottle up.

GEOFF WRIGHT: So if you were just holding a drink.

PETER RICH: Bird feeders.

GEOFF WRIGHT: Bird feeders!

PETER RICH: Birdfeeders, you hold it up like a birdfeeder and it's got the a little...

SHAWN CATES: It's easier when you're biking, for sure.

RICK WEST: And maybe like a straw!

GEOFF WRIGHT: Oh yeah, it's way easier when you're biking

RICK WEST: So maybe when you open it up, it's like a straw and it just flows right out the straw right into your mouth.

GEOFF WRIGHT: Mhmm. Hm. Interesting, what are some of the other areas that we're looking at? Psychologist, hm.

[LAUGHING]

ANNE MAKIN: Well... I was thinking that in psychology a lot of times we're trying to learn, as adults, a lot of things. We're trying to learn, as adults, are things that we should've learned from we were younger, or that we did learn when we were younger. So I was, I was trying to apply the children's Sippy cup again. But what happens if we used some type of rubber in the, in the traditional water bottle? As far as making sure that it doesn't spill if it's left open. So, that was something that, thinking back on the child's Sippy cup.

GEOFF WRIGHT: Yeah, and in psychology, everything, you're always trying to look at things in different ways. It seems like our idea of drinking from the bottom, or drinking it—why do we have a cylinder? I mean, is that really the best design? Is there another way that we should be holding cups? It seems that, I mean, if you look at Sippy cups, it, they're all tapered to be smaller at the bottom and larger at the top. A lot of glasses are designed that way. And very few water bottles, you know, they're designed the opposite. They're smaller at the top and have a small nozzle, why? You know? It seems like there should be, this goes back for a why and what if question. So looking at problems differently, yeah.

ANNE MAKIN: Absolutely. Well, that. It just reminds me of when you go hiking and they have the backpack water, and you have a little hose that comes out so you can just sip.

GEOFF WRIGHT: Yeah, you can.

RICK WEST: One thing about psychology real quick, is psychology also deals with how people perceive things, and if we're going to make this bottle with the nozzle on the bottom, we're going have to make it look cool, somehow. Cause nobody's going to walk around looking like a dork. And so, you know, we gotta somehow make it look trendy.

GEOFF WRIGHT: And I think that leads into our next principle, and that's idea networking. So this is the real brainstorm. So we've asked these questions to the associate, you've taken notes, you have these, these, these visions, I'm sure, of different products that you're going to come up. Now we start bringing in our own experience and we really get into this brainstorming, and just multiple ideas we start drawing out. You've probably had little sketches on your pad as we've been talking. We start sharing, and it's this, this tapered design where, where we had all these ideas, and now we're trying to get down to just a few ideas, where we can lead in to experimenting. And so, we'll go to Shawn with his designs and Shawn will show us his designs, and, and then Anne will pick up on some of the things that he's thinking about and start, you know, bringing together this, this mix of ideas to come up with a nice, interesting, innovative water bottle. One of the final phases after going through the idea networking, and looking at some of these designs, is to experiment, and that's the prototyping and show, tell, and act phase. And so, what we've done is all of the, we have cardstock, and paper, various plastics, and scissors, and pliers, rubber bands, we have all kinds of little tools and, and—what would you call—materials lying around here. And they've gone through and they've prototyped with play-dough and then so forth, a new water bottle design. And this is where we would have them experiment and show, tell, and act out their new water bottle. Typically, we'd have different groups present the product that they came up with, but because of limited time, you on the radio will just have to imagine this wonderful new product, that Anne, Dan, and Shawn came up with where they're drinking out of the bottom of a new, fantastic, innovative water bottle. Again, the process was observing, questioning, associational thinking, idea networking, and experimenting.

NANCY HANSON: Such a fascinating process to watch, to watch this happen. And, and I'm just seeing that, you know, if you didn't feel safe in a group like this, then it would be hard for you to just throw out ideas. I mean, you guys are just, everything you had talked about, all those crazy off-the-wall things you think. All those barriers, you know? Who cares? We're just throwing all this stuff out there, and I, and obviously that's an important element that you know everyone in the group would need to feel safe enough to, to say whatever they think, even though it's going to sound ridiculous. Do you find that when working with people in groups that there are those people that are just, "I'm not going to say anything," and they might have the most brilliant idea.

RICK WEST: And that's definitely true, especially with cultural kinds of issues. I've found that, you'd have Asian students typically don't like to speak up. Sometimes they have fabulous ideas. So you have to really work, as maybe a leader of an organization, to maybe use

technologies, cause maybe they feel more comfortable talking on the Internet, you know? But doing something to help those quiet people open up and share their ideas as well, and feel comfortable doing so.

NANCY HANSON: Yeah, and I can imagine that such a part of a facilitator's job to make sure that everyone feels safe enough to share and that, and that their voice can be heard.

ANNE MAKIN: I find those barriers also in the Church, as we're discussing with each other, that a lot of times people will, will not express their ideas or things that they've thought of, because they're worried that, "Oh, that, that might be the wrong interpretation." Or, "Maybe the teacher's looking for this interpretation," and...

RICK WEST: Or we've never done it that way before.

ANNE MAKIN: Or we've never done it that way before. And, so I feel like this process really applies to teaching in the Church and our participation as well.

NANCY HANSON: That's true. There are probably often people out there who feel like they have these ideas, but they're just too afraid, afraid to share them. Rick?

RICK WEST: Yeah, I think it's interesting that in the Church, we believe in stewardship. That's a big thing. You know, the Lord gives us problems and asks us to solve the problems, so it takes creativity to solve those problems. But I find it comforting that He doesn't ask us to solve those problems alone. I mean He's promised that He'll be with us, and that the, the Holy Ghost will be with us, but then we have in the Church, you typically are working committees and teams. Even if you're a teacher, you've got the presidency; the primary presidency will help you. That's the ideal, is that there will be people helping you to solve your problems, that over your stewardship. You know, in the Doctrine and Covenants, the Lord said that when two or three are gathered in My name, I will be there. Interesting He doesn't say that if you're there in My name, I'll be there. And, and the Lord does come and grant us help and assistance individually, but I think there's power when two or three or more of us gather in unity in the Lord's name. I think there's a great power there, and He is more likely to, to be there with us and helping us.

NANCY HANSON: That's such a great point. Maybe we can talk for a minute about how you feel that Heavenly Father gave you this talent, or how the Gospel has influenced your work. And

the ways that you use the Gospel in your work. And how do you use creativity in your calling?

ANNE MAKIN: I know in, I teach Gospel Principles in Sunday School. And we had our lesson on the Creation. And prior that week we had been talking about Bloom's Taxonomy and the different levels of knowledge. And the lower levels are recall and remember. And the highest level that he identifies is to create. And that was a really strong idea that we discussed in our class, is that our Heavenly Father created this world, and He was proud of it. In the end He said, "And this is good." And I think we see that a lot with ourselves, as well when we engage in the creative process and create a product, there's a very lasting value, a sense of accomplishment. And I've, I really feel like Heavenly Father wants us to experience that, and wants us to experience this process that, that we've done now and to be able to look at a product, to be look at, to be able to look at something that we developed as a group and say, "This is good. This is something I have to contribute."

GEOFF WRIGHT: And I, and I think a huge part of that is pedagogically I've noticed at the University things have changed over the last ten years, where more of the projects and assignments are group projects. And I think it's because the byproduct is not just a more interesting paper, or research project, or product that comes out of it, but it's the relationship. And if you think about it on a marriage level, you and your wife and the creativity it takes to raise your children in righteousness and how you, you, you bring both backgrounds, and the histories of your family and friends, and really try and create something special with, you know, the focus being an eternal family, there is a need to have the group collaboration and to be united and to kneel in prayer together. And I think, I've noticed that even at the University that the students rarely have these human relationships now that despite the technology and where they might be talking and chatting in different ways, they still are united in working on a common goal. And I think they're, they're backgrounds, and they're, they're motivation to do so is enhanced when they work as groups.

RICK WEST: I think the relationship is, is really key. We're not here just to do things in the Church, we do have to do things, but we're here to learn to love each other. And that's really what a lot, a lot of the Gospel is, and working together to solve problems allows us to build those relationships that you're talking about.

PETER RICH: Nice that our Heavenly Father's ultimate goal for us is to be able to create. And that He gives us the agency to do what we will. And he says if, we won't lose our reward, which is to become like Him, and to create, if we do good things. And that the agency is in us to do these things. He's showing actually a lot of trust, in putting that in us. And so, He says, "Go forth and create." And that was one of the first commandments He gave to Adam and Eve, was create.

SHAWN CATES: And I think the end goal of that creation is always focused on helping others. And I've noticed that the Holy Ghost does enhance our creative faculties, particularly when we're focused on helping other people. I work in the ward mission, and I, and it's interesting to think about society and the economy and how the world is changing, and I think we are going to need to do missionary work differently because of that. And, and as we've thought about that together and tried to work on our ward mission, you know, we've had ideas about sending out the Mormon Messages by email to people we meet. And creating, you know, customized pass-along cards for people might be able to put their blog address on it, or something, you know. And hand that out to neighbors who, who are friends of other faiths, and, and so I think that, that creative faculty is enhanced particularly when we're focused on blessing other people.

NANCY HANSON: Well, thank you so much. Such a great discussion. I've learned so much today, and I appreciate all of your comments and a really fun experiment. I'm excited to see how that water bottle turns out.

[START MUSIC]

NANCY HANSON: So, thank you again for being here with us. Thanks.

ALL: Thank you.

Thank you.

Thanks.

Thank you.

Glad to be here.

NANCY HANSON: You've been listening to a group discussion on Everything Creative. For more information on Everything Creative, visit our website at radio.lds.org.

[END MUSIC]