

**Bonni** [00:00:00] Getting students engaged in research is one of the ways we can make their learning experiences more tangible and more profound. On today's episode, Dr. Bethany Usher joins us to talk about what happens when students become scholars.

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**Bonni** [00:00:25] Hello and welcome to this episode of Teaching in Higher Ed. This is the space where we explore the art and science of being more effective at facilitating learning. We also share ways to increase our personal productivity approaches, so we can have more peace in our lives and be even more present for our students.

**Bonni** [00:00:52] I'm so pleased today to be welcoming Dr. Bethany Usher from George Mason University to talk about a topic we have not discussed on the show and that is how to get our students engaged in research. Now she is going to be looking particularly at undergraduate research. But so much of it will certainly overlap to our colleagues who are teaching in the graduate at the graduate level. Bethany, welcome to Teaching in Higher Ed.

**Bethany** [00:01:18] Thank you it's an honor to be here.

**Bonni** [00:01:20] Well I will just share a little bit with people that are listening. You are the director of the Students As Scholars Initiative through the Office of Student Scholarship Creative Activities and Research at George Mason University. And I would love for you to share a little bit about your academic research background and then we will cycle it back over to the broader discussion. Share a little bit about your research.

**Bethany** [00:01:44] Thank you very much. I am a biological anthropologist by training and when I was an undergraduate student myself I went to the University of Virginia and when I was there I got involved both undergraduate

research in biology on the circadian rhythms of hamsters and working on cemetery research on excavations in cemeteries.

**Bethany** [00:02:05] And the two of those things have actually traveled through so I actually still work on cemetery structure using genetic patterns and cemeteries to be able to understand what we can learn about past populations. And one of the things I've always done because undergraduate research was so important and getting me involved as an academic is make sure that I've got undergraduates involved working on my projects.

**Bonni** [00:02:27] Well I can imagine. What are most undergraduates reactions like when they hear about what you've done in your past research?

**Bethany** [00:02:35] They love it. They come up to me and they want to ask a million questions. They often have questions about their own interests. Sometimes I saw this thing and what about this? And I saw this on television. But I'm amazed at how excited when they hear what I really do. How excited students get.

**Bonni** [00:02:53] One of the things that we were sharing before I pressed the record button is about you have done a TED talk which is there for anyone who is listening who might not know this, TED has their main conference that they do but they're trying to really make TED talks more accessible and really have that community stretch well beyond those who are able to make it to that one, I don't think it's an annual conference or something like that. They have now a brand and a whole bunch of conferences called TEDx. And I would imagine that would be something challenging to get ready for. So you did one on the value of undergraduate research. What was that like to prepare for?

**Bethany** [00:03:30] Terrifying. It was great fun but it's funny, you are that talent when you're doing that and you get this whole long set of instructions on how to, what kinds of things to talk about and how to talk and you do it without any notes. And we talked to before the before you pushed the record button about how I listened to things as I walk around my lake. I must've looked crazy because for weeks before hand I walked around the lake and tested what I was going to talk about during that talk.

**Bethany** [00:04:02] And so people must have heard this crazy woman walking along listening about hamsters in the dark and cemeteries and research and undergraduates and values of higher education. It was tremendously fun once I did it. But it was a good way to make this thing all the way through what you know to be able to make it interesting in 18 minutes.

**Bonni** [00:04:25] Well, I was sharing with you too that one of my real weaknesses is this area that you are the expert in, so I'm so pleased to have you here. I wonder if you could paint the picture for us what are some examples that you have come across of what it looks like when undergraduate research is at its finest.

**Bethany** [00:04:46] What we see with undergraduates is that it gives them the chance to see. We talk about the terms of authentic research. They get to see what happens when they get to a university and they start seeing questions that don't have answers.

**Bethany** [00:05:01] I had a student this summer who was working with me and she was looking at some food policy and she came in and she sat down next to me at my desk and she looked dejected and I said What's wrong. She's like, "I went through all of the literature and I've read all these journals and all these different areas and no one's ever done this before so I can't do this."

**Bethany** [00:05:20] I just stop and say, "No. In fact you just identified a gap in knowledge. You should do this." And she took it and ran once. Once she realized that that's what it meant. It wasn't doing a research paper on what other people were doing, but having the chance to be able to look at something in a unique way that no one has known before.

**Bethany** [00:05:40] When students crossed that boundary, then the sort of the world opens up to. But they have important things to be able to say and the knowledge they've learned in high school and college has relevance for the real world.

**Bonni** [00:05:54] Did you find for yourself there was a point at a time at which you realized that that was healthy for you to share that you don't have all the answers? This is really a unique tact to me to sort of be encouraging "hey there are answers to all these questions," because I think so much of academia can unfortunately have this downside that we think we are all supposed to have the answers.

**Bonni** [00:06:14] We've looked at in the past on these shows about when we're in the classroom how healthy it can be when students struggle to do problem solving and that you don't just give them all the answers as if you had them yourself but was there a point in time you remember where you were you sort of had to make that transition as someone who guides others' research?

**Bethany** [00:06:32] Well, I think especially when you're a new faculty member or a new graduate student teaching you feel like to be legitimate. You need to know all the answers. And I think it's really one of those times where you where you realize at some point that not knowing the answers is as important in letting them know that not all the answers are known are as important as the times when you're like "of course I know what that is." So I actually think it was when before I was at George Mason University I taught anthropology for ten years SUNY Potsdam and it was it was that comfort in the classroom to be able to say "I don't know that."

**Bethany** [00:07:08] And now I actually take advantage of those moments in the classroom where students have all their devices and so forth. I'll point to one of my students and say, "Hey, they just asked that question. I don't have a clue about the answer. You want to check and see if there's anything in the Journal of ... You know whatever," and get them to start looking it up and take advantage of the fact that they may have a device in the classroom and that they can start filling things in also.

**Bonni** [00:07:30] I'm finding that I have a pretty good comfort level after teaching in some cases the same class for over a span of 10 years so it is when you get to that comfort level where you can go, "I have absolutely no clue." But I'm also finding my vocabulary occasionally it's just getting harder and harder for me to find words sometimes or think, "it's right on the tip of my tongue," but if I can relax into that it really can be helpful for them to say, "hey, could you pull out your smartphone?" I know I've got it right there I can think of a couple words you might search under. It's fun to have them begin to get that curious mind. I'm concerned sometimes that they lose that through some parts of their educational process. So how great to bring it back a little bit like that.

**Bethany** [00:08:09] Right exactly.

**Bonni** [00:08:10] What are some of the challenges that come with getting undergraduate research to work?

**Bethany** [00:08:17] Well, I think there's a set of them. There's a set of challenges for students and there's a set of challenges for faculty. For faculty one of the things that I've tried to do is we try and define when we talk about undergraduate research. We mean for it to be is if it's the scholarly work a faculty member does, then at an undergraduate appropriate level, it should be work that undergraduates can do.

**Bethany** [00:08:39] So people often think of it as being in white lab coats and a little boiling pot somewhere. But the idea that that research can happen in any discipline. It looks different but like in history or in business or in dance and drama and as well as the sciences, and for me anthropology. Getting faculty to realize that they're undergraduates are capable of making significant contributions can sometimes be a challenge.

**Bethany** [00:09:10] And the other challenge depending on the institution is that often faculty time rewards. And so trying to recapture what the value was for faculty is really important there. One of the things we try and do is talk about what do faculty get out of it. If they're at a teaching institution where they teach us 3/4 or 4/4 load, then getting undergraduates involved in their research is often a way of keeping themselves engaged in a way they may not be otherwise. If they are in a research institution, it may be a way of actually getting significant productivity if that's their expectation. So for faculty those are some of the challenges.

**Bethany** [00:09:48] For students there's a whole set of other challenges. One is letting them think that research is something for them. So there's some students come in and know this is what they're going to do. But often those students aren't the ones who benefit as much as plucking those really curious students out of other situations and saying, "You could do this. You asked a great question, why don't you investigate this idea?"

**Bethany** [00:10:13] So making sure that we are engaging all of the students and that they see themselves as being researchers. And the other thing are setting the expectations when we get to the end of every semester we have about 60 students this semester who are doing high level funded research projects.

**Bethany** [00:10:29] And every one of them comes in at their final presentation to the community and they all begin by saying, "I said I was going to do this, but I wanna actually doing this." And they're very nervous about saying that the first time but the next time and the next time that they start hearing that that's what happened to everybody, they start learning that that's the way science and research actually works is that you start off with a question but then you follow it in the sinuous path until you actually get to the point where you know what it is you're doing.

**Bonni** [00:10:58] Would you mind sharing some of the stories and examples of some of the research that's been presented at events like that to some of the ones that came to mind?

**Bethany** [00:11:06] I have a couple of really interesting examples. When I was at SUNY Potsdam one of my favorite projects ever had a student work on with me from a student who's her name is Rebecca Nelson and she's now a graduate student in Anthropology at the University of Connecticut. She was doing experimental archaeology project and she, sometimes the projects are very close to your own interests and sometimes they're far away. She had seen at a textile exhibit this knitted a band of knitted heads that was preserved from a Nasca textile from the years about AD 100 or so.

**Bethany** [00:11:45] And as an avid knitter herself. She wanted to see if she could recreate this piece of fabric. And so she actually started by getting a close examination at the Museum of the fabric and then she went and she found Llamas and she sheared the llamas and she died the yarn and knitted and discovered a whole new knitting technique called a knotting technique She called it.

**Bethany** [00:12:11] And she could even show how this piece had been reused multiple times and had been repaired several times along the way when she got into it and that was just an amazing project. And I actually have got a link to that website so I can actually give that to you so people can see that piece she made.

**Bonni** [00:12:30] Now that would be fantastic. That's sounds so fascinating, this is a little bit of a tangent but my mom I used to think that cotton grew on trees. My mom has these cotton plants in her front yard that are taller than me. And they're really quite magnificent to look at but she has had a number of people come by because cotton being from a rural area being from the suburbs I had never seen it grow except in our yard but I didn't realize how unique that was for people to see.

**Bonni** [00:13:00] And they come off just like cotton balls and people love to just come by and see them but she also has the ability to spin them into yarn. She loves textiles so she will, She's probably going to be listening and probably will like this story and want to click that link.

**Bethany** [00:13:14] I saw cotton for the first time this past fall and it was. We've had exactly the same experience.

**Bonni** [00:13:21] I had it always growing up but it's so fun that people get so attracted to and they've asked What can I come back with my daughter or my son to show them that it's really fun. I do want to mention real quick for anyone listening because if you were sharing Bethany that you listen to it while you're walking.

**Bonni** [00:13:38] And I often listen while I'm walking or driving listen to podcasts for anyone that is concerned about oh I want to click on that link but how do I remember to save it. This is going to be a [teachinginhighered.com/27](https://teachinginhighered.com/27).

**Bonni** [00:13:51] We're at the twenty seventh episode and Bethany has already agreed to send me over the links that she'll be talking about and I'll gather up anything else that we talk about and share those too so that that will be the way that you could comment on this episode, share examples of any undergraduate research that you'd like to share about or get involved in the conversation. So thanks for talking about that. That's fun. Are there any others that come to mind you'd like to share about?

**Bethany** [00:14:13] I had one more in mind. I had a student a year ago who was working with some data that I had left over. One of the things that I always recommend for faculty is that they keep just a cheat sheet in Evernote or wherever they keep a cheat sheet, wherever they have these questions where they're like: "I'd love to follow up on this but I don't have time" or "this isn't central I don't funding for this".

**Bethany** [00:14:36] So I had one of those little projects where I was where I was interested in looking at it from a population of skeletons with longbows links. And I was trying to determine I had a thought that the kids who died and were buried in the cemetery probably weren't representative of the kids who survived and lived to be adults in the same population.

**Bethany** [00:14:58] And so to do the calculations on that, I had a student who volunteered to come in and work all the way through that data and was able to show in fact that the kids who who died were in fact shorter than the kids who probably lived to grow up to be adults, which meant they were probably already sick or not doing well in this medieval population. So she won the George Mason University Undergraduate Research Symposium Award for that research and as a graduate student now in human biology. And so that was a really fun project.

**Bonni** [00:15:31] I was going to say when you were telling the first story I was thinking: "Oh, gosh, how did she come up with that?" So is part of it that you're maybe sharing some of the things that are in your little cheat sheet, your little notes to self as you go along and then if it sparks anyone's interest they can follow up with you as that. Is that what you do?

**Bethany** [00:15:53] I keep that list and when students even show a spark of interest, I say, "Hey, you know there are lots of ways to get involved in projects. If you want to come work with me, here are a set of ideas you could if these look interesting you could work on these. Or if you've got your own, bring it to me and let me work with you. And so truthfully projects are usually all along for all of our faculty are anywhere on the spectrum from a faculty sort of directed program at the beginning, especially as students are learning techniques.

**Bethany** [00:16:24] I was actually thinking I listened earlier to Jay Howard's talk with you on one of the other podcast about the acculturation issue. Students being acculturated to the classroom and in a lot of ways one of the first things that has to happen is students have to be acculturated to an academic environment. And the way things work in a lab is often very different than the way they work with me on a one-on-one kind of project or in a dance studio. And so students often will come in and volunteer to work on a project and then later on take on their own question and their own project.

**Bethany** [00:17:00] And so that actually that had happened in both of these situations was Rebecca had worked on other things with me and Marion had worked on other things with me. So students often start by learning and then start taking their own sort of responsibility for their own project.

**Bonni** [00:17:15] What are some of the considerations that we should be taking around how much to let them be free and to have the opportunities to fail and how much should we be protecting maybe our own reputation or the university's reputation? Where do you balance all that?

**Bethany** [00:17:32] I think that undergraduates are actually much more tolerant of failure than it would be if you were working with a graduate student, because graduate students they need to have data to be able to publish and to be able to finish. We want them to graduate and go on to have real lives also. Undergraduates are often in an exploratory time. And so undergraduates you can give a project that may or may not work that you just thinking through because the experience is usually as important to them as a publication for instance, and often more low stakes for them.



**Bethany** [00:18:05] And learning what they can do and what they can't do and what they like to do and what they don't like to do are really important. You would hate to have a student who really did not like being in a lab committed to that kind of long term career, if they hadn't had experience doing that. So getting them to think about the kinds of things that they really like to do or having the opportunity to say "I'm glad I made a contribution here. But this is not what I'm going to keep doing" is important.

**Bethany** [00:18:33] And also finding out that one of the things we've spent a lot of time doing in research is working with an Excel spreadsheet for hours or doing the same experiment over and over and over again or searching for a letter that never shows up in an archive.

**Bethany** [00:18:50] I think it's important. It talks about that idea of perseverance and being able to recognize here's a pattern, here's a way of getting engaged in something. So I think that undergraduates are in fact much more tolerant and it's a valuable part of the research. We shouldn't be afraid of giving them projects that may or may not work.

**Bonni** [00:19:10] What are some of the components of what makes up authentic research?

**Bethany** [00:19:17] I've always said that the authentic research is when the faculty member and the student don't know the answer when they began as sort of the baseline for what's authentic. And that it's an interesting question. It's doable it's answerable with data but it ought to be. And the data can be anything, it can be. Does this music work with this choreography piece or it can be "does this type of advertisement work for this nonprofit organization?"

**Bethany** [00:19:46] So I think that I think that authentic is a real question and the answer isn't known yet.

**Bonni** [00:19:54] And what have I not asked you about because we've got plenty of time, because we haven't we haven't finished our walk around the lake yet. But I want to open it up to you to say what have you not shared yet but we should make sure we get into before we go to recommendations.

**Bethany** [00:20:09] Well I think one of the things to think about is where to place the research and the curriculum because there's especially a sort of large

diversity. Often there are many more students seeking research opportunities than there are faculty with the ability to take them all one-on-one.

**Bethany** [00:20:28] And so one of the things I've been working on a lot recently especially being at a university as big as George Mason has been trying to think about the continuum between class-based research and independent research, students do either by themselves or one-on-one with a faculty member.

**Bethany** [00:20:46] And I think that there are some real challenges in getting authentic research in the classroom. But on the other hand I see real benefits. We have a we have a faculty member here on campus whose name is Changwoo Ahn who works on wetlands ecology and he taught one of our first research enriched classes.

**Bethany** [00:21:04] And we worked with some of the models for how to do this and he was studying how different wetlands areas and in ponds adapt to the kinds of runoff that come from both urban and rural areas. And so the model he was using was one of these where there were a bunch of unique class projects but there were all had the same basis with teams of students doing research that no one had done before.

**Bethany** [00:21:29] That's actually a fairly hands on kind of way of doing it. There are sometimes shared class projects where all the students collect data that are all contributed to the same sort of database and then they all analyze that sort of take their own research question out of it.

**Bethany** [00:21:45] There are also people who try and have students do individual authentic projects within a class and that can be difficult just because it's difficult to manage depending on the size of the class but it can also be really successful if it's done sort of as a as a research team approach. And then you can start moving individually into toward undergraduate projects. But I think that challenge of getting research in the classroom is really important.

**Bonni** [00:22:10] What recommendations would you have for faculty listening who are at an entirely differently resourced institution where they don't have an office like yours that they could get some guidance from?

**Bethany** [00:22:23] One of the things that I would consider is looking at at models. There's an organization that we were going to hear about the little bit later but the Council on Undergraduate Research is a national organization that

publishes the undergraduate research the current council on undergraduate research quarterly, which is a journal that publishes articles and models for people and they have a ton of resources about what kind of models work in lots of different kinds of environments. And so I think that that that organization would be really helpful.

**Bethany** [00:22:56] I also think that setting out a protocol for what what do you expect for your students to be able to do. We have a rubric on our website that we use to be able to look at how do we get students involved from the very beginning all the way up to doing and taking responsibility for their own research projects.

**Bethany** [00:23:13] And it may not be that people are prepared to be able to support a student through you know a fully resourced research project all the way through all the way to a high level. But it may be that there are elements of this that they could bring in elements of research kinds of activities that they would want to bring in. And those are probably some resources there too.

**Bonni** [00:23:34] That's good advice and before we close out this part of our topic, what would you say to those who are still a little bit fearful that they're not going to be able to have something to offer in this area? They are fearful of their own failure in it.

**Bethany** [00:23:52] So I think students they should they should know that students are impressed by almost anything that we do. We know we have much more information than they do and so students are amazingly good-natured. We were talking a bit earlier that you had a visitor on your podcast. Cameron Hunt McNabb was talking about undergraduate research as a creative assignment for students. And Jim Lang was also talking about about creating assignments that are uncheatable. These are assignments with students who are doing something unique and I think that's a good reason to start that there isn't a terrible way to do it.

**Bethany** [00:24:38] You're just going to take experimentation and this works and this doesn't work. But your students as long as they understand that you're doing this in a way that's trying to enhance their educational opportunities are going to be good-natured about being able to participate with you and appreciative of the opportunity.

**Bonni** [00:24:55] So this is the point in the show which we each make a recommendation and I thought of one while you were talking. One of the things

you were talking about sort of between the TedX talk you were preparing for one of the things that you didn't mention but surely is a big part of any TED talk is making our power points not deliver the presentation for us but to support it through very visual ways they have incredible visual and actually it's not even necessarily always PowerPoint. Sometimes though they'll actually bring out, I hate to call them props because that seems so simplistic but so really incredible just ways of making the talks something visual, something memorable that people will take with them.

**Bonni** [00:25:36] So there is a link that I will put in the show notes to a great slide show that just reminds us how do we take our ideas and make them more visual. And so much of it is just being willing to leave things off to make it more simple take more of the words off and not try to have five pictures but just one main idea per slide so I'll put that link in the show notes in the hopes that we can continue all to make our Powerpoints less wordy and much more visual and that much more memorable too.

**Bonni** [00:26:07] What do you have to recommend recommend for us today?

**Bethany** [00:26:10] I may actually even get two things. One is I would recommend that if you do have undergraduates who are doing research, if they need opportunity to present the results of that research through the National Conference on Undergraduate Research, is an annual event usually in April and I actually went for the first time last year.

**Bethany** [00:26:30] I've sent students before. But it is an opportunity for students to be able to share their research with the undergraduates from across the country often in similar kinds of fields. And the conversations that happen and the ideas that are shared and their opportunity to see how this works in other environments and there are other students like them is fantastic.

**Bethany** [00:26:54] There also recruiters for graduate programs. There's all sorts of other benefits that happen and they get great professional experience. So that's one of my recommendations.

**Bethany** [00:27:05] The other one that I would recommend is that if you're thinking about about getting more authentic research in your classroom the book Engaging Ideas by John Bean.

**Bethany** [00:27:15] In the second edition of that he added a chapter called "designing and sequencing assignments to teach undergraduate research".

And even though I've been doing this for years when I read that chapter I kept going, "Right. I should be doing that right. I should do that too." So I really enjoy that chapter and would encourage others to to read that.

**Bonni** [00:27:33] Well, Bethany thank you so much for those recommendations and throughout this entire episode for all of the guidance you've given us and really the inspiration to give us a little bit the courage to step out and start taking some risks in the area of undergraduate research.

**Bethany** [00:27:49] Thank you. I appreciate being here and it's a lot of fun.

**Bethany** [00:27:53] Thanks again for listening to this episode 27 of Teaching in Higher Ed. If you'd like to access the show notes once again those are at [Teachinginhighered.com/27](http://Teachinginhighered.com/27). If you have any feedback on the show that's at [teachinginhighered.com/feedback](http://teachinginhighered.com/feedback).

**Bonni** [00:28:10] And if you haven't yet subscribe to the weekly update, it's just once a week in your inbox. You get all the show notes with the great links that are suggestions and recommendations from our guests and also from me and it's just one e-mail a week that'll be a great resource for you to follow up on a lot of the things that we've talked about on the show.

**Bonni** [00:28:29] Thanks again for listening. And I'm looking forward to a terrific 2015 together as we grow our teaching skills and talk to more guests and find out more about how to enhance our facilitation of learning. Thanks for listening.

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