



Russell Stevens

Russell Stevens: [00:00:00] We want to teach our children and students to understand that this is a special animal. If I'm going to be involved with any kind of seafood, let's see that we're doing it responsibly because I don't want to eat the last specimen of that particular species.

Annalies Corbin: [00:00:25] Welcome to Learning Unboxed, a conversation about teaching, learning, and the future of work. This is Annaies Corbin, Chief Goddess of the PAST Foundation and your host. We hear frequently that the global education system is broken. In fact, we spend billions of dollars trying to fix something that's actually not broken at all, but rather irrelevant. It's obsolete. A hundred years ago, it functioned fine. So, let's talk about how we reimagine, rethink, and redesign our educational system.

Annalies Corbin: [00:01:00] This is Annalies Corbin, your host of Learning Unboxed, back on the road. This time, we are in Cape Town, South Africa. We are hanging out at the Pier and Wharf District within the beautiful, bustling city of Cape Town. And today, we have an incredibly special treat, and one that is near and dear to me and my background in maritime archaeology. We are going to be visiting with Russell Stevens, Head of Education of the Two Oceans Aquarium. And what makes this so spectacular is that the location of the two Ocean Aquarium, as you will hear from Russell as we go through the interview, makes it the perfect location to be one of the most impactful education programs in the world.

Annalies Corbin: [00:01:52] Russell and his team are out to save the planet. And you're going to hear how they're doing that. They have a very, very creative Marine Sciences program. And I just want to preface a lot of this as we get ready to have the interview by letting you all know that not only is everything that you're going to hear from Russell very widely and freely available. We will post all of the resources as we go through. But more importantly, South Africa is the first country on the planet to legislate the saving of the oceans by creating a program option in the high school levels, so folks can actually swap out fields of study and choose Marine Sciences as an option towards their high school graduation. And it's a very, very innovative program. Russell and his team are deeply, deeply passionate. And so, we're going to go into the aquarium and record live for the interview. So, join me as we step off the streets of Cape Town and into the Two Oceans Aquarium.

Annalies Corbin: [00:03:05] So, I'm very excited to be with my guest, Russell Stevens, who's Head of Education at the Two Oceans Aquarium. So, Russell, thank you very much for taking time today.

Russell Stevens: [00:03:15] You're welcome. It's my pleasure.

Annalies Corbin: [00:03:17] I am thrilled to be here in an absolutely amazing classroom setting that you've created here at the Two Oceans Aquarium. So, let's start for our listeners. They're coming

from all over the world and not everybody has had the benefit of coming to Cape Town. So, start with a little bit about the Two Oceans Aquarium. What is this place and why?

Russell Stevens: [00:03:36] Two Oceans Aquarium started in 1995, same year that the South Carolina Aquarium opened. It was put in this place because the Western Cape of—or the Western South African region is regarded as one of the biological biodiversity hotspots on this planet. And that's because we have a really interesting current that is found off our west coast. It's called the Benguela Current. And while it's travelling in the Atlantic Ocean towards Angola, towards the north, it is assisted by the strongest up-welling you will find on this planet. 22 meters on average a day is the level of up-welling.

Annalies Corbin: [00:04:32] Wow!

Russell Stevens: [00:04:32] That brings up huge volumes of nutrients. On the other side of our coast, on the East Coast is the strongest current that you find on the planet called the Agulhas Current. Because of the shape of Madagascar on the coast of the east coast of Africa, you will see this current being funneled down towards the south. And at that point, because this warm current gets as far south as it does, our south coast of Southern Africa ends up having a mixing of this cold weather and upwelling waters, and the Agulhas Current that is being brought down from the tropics. That leads to, of our whole planet, for example, 22,000 species that have recently been recorded of marine fishes, you will find 10% of them off the South African coastline, which is 3200 kilometres long. Of those species, 10% are endemic.

Annalies Corbin: [00:05:46] Wow!

Russell Stevens: [00:05:46] Marine invertebrates, similarly, 10% of all marine invertebrates found off—on our—in our oceans are found off the coastline of South Africa, and 10% of them are endemic. Marine plants, seafood plants, called seaweeds by some, 10% are found off the coast of South Africa, and 10% were endemic. So, this high level of endemism led the designers of the Two Oceans Aquarium to put together an aquarium, which apart from three or four species, this whole aquarium houses animals from local waters. So, it is the ideal locality for them.

Annalies Corbin: [00:06:40] And so much opportunity to teach.

Russell Stevens: [00:06:43] Well, I was going to get to that, which is the most important reason as to why we exist - conservation and education. We are facing one of the greatest climate challenges that we've ever faced. A month ago, my daughter said to me, "You're going to die of old age, but I'm going to die from the effects of climate change." And that indicates how human activity on our planet, planet and ocean, has been effected in a way which we need to educate people about rather than saying, "It's so and so's fault, and so and so's fault." And so, education is the core reason as to why we, as an aquarium, exists alongside conservation, and more recently research as well.

Annalies Corbin: [00:07:38] Right. And so, we are actually sitting in the classroom setting or one of the classroom settings that you have created for the purpose of trying to educate these masses. For our listeners, what you're hearing in the background, because typically we record this program in a studio, but we are on the road with this show right now, so, you're hearing the aquarium pumps in a really, really innovative classroom that has been created. And we'll talk about the program in a moment. But Russell, could you share with our listeners, describe what they're hearing in terms of the

way you laid this classroom setting out? For anybody that wants to do a dedicated, applied classroom learning setting, explain what's here.

Russell Stevens: [00:08:27] We have an eight-meter-by-eleven-meter showroom, and we thought, "What could we do with this?" We, then, got fresh seawater that we were pumping through the building, in any case, and we've got air. We, then, designed workstations, which are, in a way, half moon but they are six-sided. And what it allows is for cooperative learning to take place. Students can have a discussion, but there are no students that have their back to the presenter because the side of the workstation facing the presenter is a flat side. And you'll see that on the pictures that are associated with this podcast.

Annalies Corbin: [00:09:09] Yeah, the photos will be posted online. Yeah.

Russell Stevens: [00:09:11] And on each of these web stations, there is a tank. It's a tank. Inside, there will be animals such as anemones, sea stars, and sea urchins. And it is an opportunity for the students to touch and connect with the marine environment. We're so conscious, after the work done by Richard Louv, about connecting children to nature. The last child in the woods, saving our children from nature deficit disorder. There is no point in doing environmental education, no matter what John will say, or what all the people from Wisconsin who came out of that whole field of environmental education, there's no point in doing it unless you can connect-

Annalies Corbin: [00:10:05] Absolutely.

Russell Stevens: [00:10:05] ... children, adults, the learning community with nature. So, children can literally put their fingers into the water, and they can then taste that it is salt water. And by doing that, we are connecting them. As I've just splashed you, I'm connecting you with nature.

Annalies Corbin: [00:10:26] Exactly. And we know that frequently, at the PAST Foundation, and over and over again, you've heard through Learning Unboxed, many, many people talking about the importance of the children having - no matter what age, and I use children loosely-

Russell Stevens: [00:10:43] The learning community.

Annalies Corbin: [00:10:43] ... and even as adults, right, we learn best when we're actually able to touch, to feel, to smell, to experience.

Russell Stevens: [00:10:49] Correct.

Annalies Corbin: [00:10:49] And so, by literally moving the teaching and learning out of the traditional mindset and into a very immersive mindset, we know that the kids will remember the things that you teach them here. So, let's talk a little bit about the program that you created. You have an amazing ecosystem. This aquarium sits in a location that makes it very easy for you to teach so many different things because of the environmental setting. So, let's talk about the program itself. So, you have a very comprehensive marine sciences program that has multiple components, different age levels, different opportunities to engage. Why don't we talk about that a little bit because you created this program along with the staff and everybody here, but this is kind of the brain child, if you will.

Russell Stevens: [00:11:36] Yes, it was 19 years ago where I walked here, into here. And this was a computer lab. And so, we got to the-

Annalies Corbin: [00:11:43] The space we're sitting in was a computer lab?

Russell Stevens: [00:11:45] It was.

Annalies Corbin: [00:11:45] Which is very sterile, I would imagine.

Russell Stevens: [00:11:47] It was.

Annalies Corbin: [00:11:47] So, this was-

Russell Stevens: [00:11:47] And people had-

Annalies Corbin: [00:11:47] ... far more engaging.

Russell Stevens: [00:11:47] You remember CD-ROM days?

Annalies Corbin: [00:11:53] Yeah.

Russell Stevens: [00:11:53] That's what's in that. So, the entry level of learning within this aquarium is students arrive, and it can be students from early childhood grade R recorded. I think you call it K in America.

Annalies Corbin: [00:12:04] Correct.

Russell Stevens: [00:12:05] Through to, what we have as university students. You might call them college or university students. I'm not sure exactly how one would define that. So, you've got students who arrive here, and they, typically, have a 45-minute lesson. Typical zoo aquarium type of lesson. On the smart board, they will be shown a PowerPoint. Linked to that are clips, little video clips, the short ones that highlight certain learning patterns and programs that we do. The students are able to touch and taste the water, touch and experience the textures, experience the colors if they're sighted of these animals, and be able to connect in a way where we give them what we call an underwater wonders experience. That is from K through 12 and beyond.

Annalies Corbin: [00:13:05] And these wonders?

Russell Stevens: [00:13:08] It's up to the entry level of the children. Going back to the work of the University of Wisconsin, Hungerford and Volk in 1997 wrote about the entry level of your students. And we have got qualified school certified teachers. That's really an important element of our program. We have over six of them. You've met one of them, Wandiswa. These are people who, when they are teaching, are able to assess what is the entry level of the prior knowledge, the previous experience of the group that has come in.

Russell Stevens: [00:13:49] Any program like that cannot be developed just for one individual. Not everybody in a class is a clone of another. Because of all the personality theory you can read about in psychology, we understand, if we've got as a group of 60 students or 35 students, we have got 35 personalities walking in. Each of those personalities learn in a different way. A certain cohort of them will be tactile. A certain cohort of them will be visual, and some will be verbal, and some will be numerate in the way in which they prefer learning. We endeavored to teach with a range of methodologies that, then, allows our pedagogy to connect with them.

Annalies Corbin: [00:14:45] And it's very, very inquiry-based by design.

Russell Stevens: [00:14:48] Exactly. When we teach, we do not give information. We ask questions, so that we can elicit information. That's a key inductive pedagogical approach. So, I've explained that the entry level. Then and very briefly, we have got a series of specialist courses grade 6, grade 7,

grade 8, 9, grade 10, and then grade 11. The grade 6 course is a fun introduction to marine sciences. Lots of fun experiments. Lots of hands-on engagement. We have a group of students that left an hour ago. That is four Saturdays or four school holiday days.

Russell Stevens: [00:15:33] Then, we have the grade 8 and 7 course, which is an environmental footprint course. No point in doing any education unless we are aware of our environmental footprint, and what impact we are having on this planet, and to teach about environmental responsibility. The grade 7, the grade 8 course, and the grade 9 courses are fairly similar. They are linked very closely to our marine sciences curriculum that we have written, and we start bringing in the curriculum in the way in which we introduce these students to—we encourage them to study maths and science from grade 10, 11, and 12. And we do lots of experiments, inquiry-based work, and that typically is a five-day course.

Russell Stevens: [00:16:23] And then, the grade 10 course is a volunteer program course. We teach students to be able to go into the aquarium, and serve at the microscope in the touch pool. And that is the place where we encourage those students to start giving back to the community in the way in which they function. We teach them how to engage with the public. We teacher them how to understand what volunteerism is. Very different from America. In America, it's a more resourced place. People have got lots more funds and disposable income. So, for children, they typically would go out and work in the school holidays in order to just help their parents buy food. Not to help their parents or themselves have extra disposable income. To volunteer and to understand that it's a give-back time is a critical, important point for them.

Russell Stevens: [00:17:17] Then lastly, our grade 11 course, we have found university professors to have indicated that our curriculum has got gaps of what they've expected students to know when they sit in the first year in a zoology class for marine biology or an oceanography class.

Annalies Corbin: [00:17:38] So, are students not getting those skills, that content - I guess, really, less skills, more content - in a regular school setting? They're getting it here. So, when they move on—just to help our listeners understand, is that a gap that's coming specifically, or that was identified in the aquarium setting, or generally across the educational sort of system within Cape Town and South Africa?

Russell Stevens: [00:18:02] We found that feedback from the University of Cape Town, the University of Stellenbosch.

Annalies Corbin: [00:18:09] Okay.

Russell Stevens: [00:18:09] So, the four universities of our state called the Province of the Western Cape. However, as we've written this material, we are finding that this message resonates with our colleagues in Bangladesh, our college in China, Taiwan, the United States, and Canada.

Annalies Corbin: [00:18:26] It's universal. It's absolutely fabulous.

Russell Stevens: [00:18:28] There is a lack of what—I think these university professors have indicated as a lack of content knowledge. That is what we call core content. So, if you, for example, want to do algebra, you cannot do that if you haven't drilled and understood your table, we call it in South Africa, I'm sure in America, it's similar. If you don't know your tables and bonds, you can't factorize. So, how can you do algebra? In the same way, how can you do marine sciences at university level if you don't understand the key concepts of salinity, of pH, of water quality, of eutrophication, for example, and why excess nutrients are actually a pollutant in Chesapeake Bay, or

whichever bay you're going to be referring to. You also need to understand the basic understanding of the dynamics of how animals have evolved and come into being.

Russell Stevens: [00:19:31] We have, as a core content, right from Grade 6, teaching children about adaptations and how animals have evolved and been in place. If they get stuck into that for the first time in grade 10, then they don't have the fundamental understanding of how the planet came to be, the origin of the planet, and the origin of how the salt with seawater and all of the dynamics of the oceans as we know them, and they are today.

Russell Stevens: [00:20:09] So, on our advisory board for curriculum that we've designed, which has 85 topics leading around a whole range of fields, which we'll probably get to, that curriculum actually feeds us to understand what we can do to set people up from our advisory board into this content, exclude that content, so that we've got a good basis of core knowledge that students will be able to enter university system, and be able to speak with confidence, and to be able to debate with confidence knowing that they get the basic understandings at their fingertips.

Annalies Corbin: [00:20:52] Yeah, it makes it so much more relevant. The kids who come, for example, in the 6th grade, do they typically then come and do multiple components of the program, or is the program structured in such a way that, say, a small group that comes in the 6th grade may not come again until the 9th or 10th grade? What do you traditionally see with this?

Russell Stevens: [00:21:14] When we have students from a particular school, when they come in, they could come 12 years in a row, and they will do a different program each time.

Annalies Corbin: [00:21:27] Right. Each in the different grade level.

Russell Stevens: [00:21:28] It depends on the school teacher that's facilitating who connects with our aquarium teachers, and that's how we design the program. The courses that we offer, these courses are very specialized. We accept only 55 students. We normally get applications from 400 students. We will only take 2 maximum per school-

Annalies Corbin: [00:21:53] Okay, okay.

Russell Stevens: [00:21:54] ... so that there is a diversity in terms of demographics, in terms of race, in terms of where these students come from socioeconomically. **Annalies Corbin:** [00:22:03] Sure, sure.

Russell Stevens: [00:22:06] So, we have a rainbow nation kind of representation within the classroom. That's purposefully done because we have a great intent of being relevant from a sociological perspective in our education basis.

Annalies Corbin: [00:22:23] Right, right. That PAST Innovation Lab is structured very much like that. So, I try to make sure we have the greatest diversity of thought, of experience, of folks participating.

Russell Stevens: [00:22:32] Yes.

Annalies Corbin: [00:22:32] Absolutely.

Russell Stevens: [00:22:33] So, the key thing we try and encourage these students to do is—so, they arrive in grade 6, they do the grade 6 course. Then, the following year,

they apply to do the grade 7 course. They weren't necessarily getting in. And then, the 8, and the 9, and the 10, and then the 11.

Annalies Corbin: [00:22:49] And what would you say is the percentage of students that start in the sixth and go all the way through?

Russell Stevens: [00:22:55] Well, we probably get about a 20% retention rate within that.

Annalies Corbin: [00:23:02] Over the course of that length of time, yeah.

Russell Stevens: [00:23:04] And the students don't necessarily go and do marine biology. This morning, we had two volunteers assisting us. They were marine biologists, marine science students about five years ago. The one is doing maritime law. The other one is doing ecosystem studies in marine biology. And actually, the previous course we had, we had somebody doing medicine. So, the basis of our learning-

Annalies Corbin: [00:23:32] Are connected, yes. **Russell Stevens:** [00:23:32] Yeah, is it's all connected.

Annalies Corbin: [00:23:34] Oh, absolutely. Incredibly powerful for those participants. And I love the fact that you encourage the students who are able to come back and volunteer in the aquarium itself. We've seen time and time again in our research and our own applied experience that when students are actually able to become the teacher, even in that setting, that the learning is that much deeper. You know that it's stuck. It's very powerful for those participants.

Russell Stevens: [00:24:02] When we do a course, like this morning's course, the first thing the students do when they're about to do a course is they do a pre-test. And that identical assessment is offered at the end of the course.

Annalies Corbin: [00:24:16] Pre and post, yeah.

Russell Stevens: [00:24:18] The pre-test to be an average score of about 20% to 30%. And we expect the first test to have an average of 80%. Separate from that, every morning, the students do an assessment on the previous day's work. And that score is recorded on the certificate they get at the end. Those who want to do really well, who want to get 80%, we ask them to do an extra component, a certain number of hours volunteering. But they also need to give back to the community. So, they need to have organized a beach cleanup themselves or some eco club activity. So, they need to go back to their schools, and they need to give a program either in their class or their school assembly. And that's the way they contribute back into the community from which they come from. The other thing that we ask them to do in the grade 6 and the grade 7 course is they come back to the aquarium, and in the auditorium, they do presentations on the work that they've done at school.

Annalies Corbin: [00:25:36] Excellent.

Russell Stevens: [00:25:36] So, they show that they have done a follow-up, and they've done some kind of really community—some contribution to their community.

Annalies Corbin: [00:25:50] Yeah, I love that you've incorporated the authentic audience component. Again, that is so much more meaningful. Yeah, I tell teachers all the time, an audience of one is great, but who cares at the end of the day? And so, the fact that you have them go back, and doing service projects or presentations after school, and then back here again, you're expanding the

audience that makes the relevancy of what you're teaching them so much more powerful. And we see repeatedly that when schools, teachers, community centers, museums, and aquariums incorporate that somehow in their programming that you have a much, much greater retention of knowledge.

Russell Stevens: [00:26:32] And I think, actually, giving these students an undertaking that they need-

Annalies Corbin: [00:26:39] Absolutely.

Russell Stevens: [00:26:39] ... to take it seriously, and they must study, even though it's a holiday program, they must study every evening. It's a lot of work. We unashamedly have made this an academic program.

Annalies Corbin: [00:26:50] Yeah.

Russell Stevens: [00:26:50] And so, academically, they need to study. And we've had students flying in - one from Philippines, one from Vancouver. We had one flying from our East Coast, a young lady in a wheelchair whose parents came through with her, and she was sitting there at the back for the course and loved the support, loved the participation. Actually, her apparent disability was really a way in which she was brought into the community in a beautiful way because everybody was able to, in some way, contribute to-

Annalies Corbin: [00:27:26] Sure.

Russell Stevens: [00:27:26] ... helping her, get her out the ferry, either push her on the ferry on the wheelchair.

Annalies Corbin: [00:27:31] And still be able to participate. And again, the setup that you've created has made it very accessible in that sense. So, when—what about the teachers, outside of your own teachers and a teacher who's bringing students specifically in? Do you do a lot of trying to take your programming and instill, at least, components of the content into your mainstream education, at least, in the surrounding area through teacher professional development or workshops? How does that all work for you here at the aquarium?

Russell Stevens: [00:28:03] In 2002 to 2005, we used to run teachers workshops, and we had up to 700 teachers participating in our teachers workshop. Alongside that, our state province had teacher training. And we eventually found that these teachers were- weren't chalked up.

Annalies Corbin: [00:28:31] Yeah.

Russell Stevens: [00:28:31] So, they didn't participate. We were challenged with this whole program. And so, we ended up thinking quite long and hard about how we would effect the formal education landscape. And we were approached by district officials and state or provincial officials saying, "You're doing so much really valuable content in your courses. You need to write a curriculum." Unlike what is happening in America, in America, you can do a whole range of all sorts of subjects. There are only 27 subjects that you can do from grade 10 to grade 12 in South Africa.

Annalies Corbin: [00:29:21] Okay.

Russell Stevens: [00:29:22] So, you, in grade 10, have to decide on six subjects, and those are the only subjects you take from grade 11, through to grade 11, through to grade 12.

Annalies Corbin: [00:29:34] Wow!

Russell Stevens: [00:29:35] So, you would say take English, and [indiscernible], and maths, and physical sciences. You might take life sciences, you might take geography. And then, all students have to do life orientation as the seventh subject. Of the six subjects, you've only got 27 subjects to choose from. What we have done is we've written a 27th subjects-

Annalies Corbin: [00:30:03] I see.

Russell Stevens: [00:30:03] ... which we now have called marine sciences. And that is not for our province of Western Cape. It is for the Eastern Cape, for KwaZulu-Natal, for Gauteng. So, the whole country.

Annalies Corbin: [00:30:16] You could choose this, marine sciences-

Russell Stevens: [00:30:19] Any one-

Annalies Corbin: [00:30:19] ... as one of your six?

Russell Stevens: [00:30:22] Exactly.

Annalies Corbin: [00:30:22] In grade—starting in grade 10, and you would carry it through grade 12, no matter where you're from within South Africa.

Russell Stevens: [00:30:29] Yes. But the school has to apply for students in their school to do it.

Annalies Corbin: [00:30:38] And a teacher, a local, a teacher in the school is the primary instructor.

Russell Stevens: [00:30:41] Yes. So, they will, then, be trained by us.

Annalies Corbin: [00:30:45] So, that teacher in that school, in that remote location, not in—and I say remote, just not in Cape Town comes trains with you and your staff, learns to do and deliver the curriculum.

Russell Stevens: [00:30:56] Yeah. So, we've undertaken-

Annalies Corbin: [00:30:58] Wow!

Russell Stevens: [00:30:58] ... for the introduction of this course. It's fantastic because our South African, the equivalent of a federal gazetted law legislation, it was signed into law last Friday.

Annalies Corbin: [00:31:13] Wow!

Russell Stevens: [00:31:14] So, we are so close to having it to be implemented in 2020. In the initial phase, we had the Two Oceans Aquarium have undertaken to be the support for the teaching community. We'll only start with 20 schools in the beginning. And each of the schools will have a champion. So, there are a couple of criteria that we've set in place for a school to be offering marine sciences. The first is it must have a functioning school management team and a parent board of governors. It must be functional. They must not be a situation where taking marine sciences detracts from the academic standing of the school. There must be a champion principal. There must be a

champion teacher to run with it. They also must be undertaking to train up junior teachers, so that if that teacher was to leave, there will be a sustainable approach within the school.

Annalies Corbin: [00:32:18] So, you're building internal capacity for purposes of sustainability.

Russell Stevens: [00:32:21] Exactly. **Annalies Corbin:** [00:32:22] Excellent.

Russell Stevens: [00:32:23] And then, what we will do is we will have a video Skype meeting with our staff. Who are they? From every one of those schools, they will have a video conference call every Monday evening, and we will discuss the teaching for the week. And who's doing which assessment? Can you from this place, from this province, share with another person from this province? This isn't inland province. We don't have this access. How do we deal with this? Can we, as the Two Oceans Aquarium, courier equipment to the inland province? How do we make sure that everybody is able to participate adequately within it? So, that is a kind of marine sciences teacher training that will happen. We've written the curriculum. We give them copies of the curriculum. They can download it. And it is a very balanced reflection of our courses, which really was an enrichment from our one-hour-forty-five-minute lesson that we would offer here at the aquarium.

Annalies Corbin: [00:33:29] For your regular school visitors, how—so, this is just—have you had this first group of 20 schools, or this will start this coming academic year next year?

Russell Stevens: [00:33:39] We've had studied the schools this year piloting. **Annalies Corbin:** [00:33:41] Okay, pilot, okay.

Russell Stevens: [00:33:41] And then, probably, we want to have 20 next year. We might have one school in Harting. We might have one school in Durban in the East Coast, KwaZulu-Natal area, and we're thinking maybe six schools in the Western Cape area. So, it might be a maximum of 10 schools in the first year round next year.

Annalies Corbin: [00:34:02] Right.

Russell Stevens: [00:34:03] But we have piloted it where we have gone out to schools who or schools which are the pilot schools, and we're offering this program to on Tuesday and Thursday afternoons for two hours on each afternoon. And that then makes up what the requirements of the curriculum is. It needs to be a four-hour training program per week for 40 weeks of the year.

Annalies Corbin: [00:34:33] Okay, for the students, four hours a week of exposure to the program.

Russell Stevens: [00:34:37] Yes.

Annalies Corbin: [00:34:38] Yeah.

Russell Stevens: [00:34:39] It's not always working. So, we, now, are encouraging students to accept that they'll need to do six hours, so that four hours actually happens.

Annalies Corbin: [00:34:48] Right, right.

Russell Stevens: [00:34:50] The sport—in South Africa, there's a different approach to sport. Many of the sports are run by schools. So basically, you'll have a netball or hockey, field hockey, I think you call it, or rugby, which is union rugby, which is not like your football. It's more like a British rugby approach. Canadian people would understand because they've got a rugby team. So, all of this is in

the school program. And to have an extra mural club like this is impacted upon by the sports and the other activities. So, in essence, we've had to try and find a way through this. And we've, now, suggested that they need to have three hours twice a week.

Annalies Corbin: [00:35:39] Right, right. And so, as the program, then—as you crafted the program and your experience with the program of moving it from here at the aquarium into the field, if you will, into these schools, we talk with schools all the time as they take on new programs, and there's a lot of trepidation, especially of teachers who are feeling overwhelmed by the task at hand. The everyday teaching I have to do. And now, you're asking for one more thing from this champion teacher to be able to do. And so, having that champion administrator clearly is key. We see the same thing when you bring new programs in. If the administration is not fully on board, it's never ever going to be successful. So, I would say good on you for making that a requirement. But in addition to the sports-

Russell Stevens: [00:36:35] But let's just come in there.

Annalies Corbin: [00:36:35] Yeah.

Russell Stevens: [00:36:36] I want to come in there.

Annalies Corbin: [00:36:37] Yeah.

Russell Stevens: [00:36:38] The objectives of the subject are very clear that it has to be a standalone. So, when somebody studies history at the school level, they don't become a professor of history. One appreciates that they're going to pick up skills that the history curriculum is teaching them. They have an understanding of how to write an essay. They understand of the causes of a particular human event, and the effects of one human event, and how that impacts on human rights, how it impacts on human dignity, how this particular march, whether it was in Moscow or in Martin Luther King's time, that march had this impact on the community. And so, they have this understanding. That is the skill we leave them as they go through in life with. And so, we believe that these are standalone skills that can stand alone. It's mental constructs. It's the core knowledge we've discussed. We need these students to gain confidence.

Russell Stevens: [00:37:41] We also teach on a purposeful level multidisciplinary. We do not want to have people in the medical field anymore who only think about the heart and not about the other organs within the body. We need students to understand a level of multidisciplinary. And that is what we are trying to teach.

Russell Stevens: [00:38:06] We also are trying to teach sensitivity. Gone are the days when we must assume that sensitivity is going to be absorbed through families or an understanding with nature. We want to teach children and students to understand that this is a special animal. If I'm going to be involved with any kind of seafood, let's see that we're doing it responsibly because I don't want to eat the last specimen of that particular species. So, that's really broadly an important level of what this curriculum is about. It stands alone with its specific skills.

Russell Stevens: [00:38:56] To get back to your point about what teachers must take on, teachers are doing too much. So, we would encourage the teachers not to take on this cause, to teach it unless they've dropped something else. So, there was a teacher the other day that was thinking, "We, as a school, might drop one of the subjects and replace that subject." One of the 26. So, it could be history or geography. I won't mention the name here. And that subject will, then, no longer be taught in the school because less students are wanting to take it, for example. So, we want to be able to pace our education partners. And those are the teachers, the champion teachers at the school, to be able to pace themselves through the content.

Annalies Corbin: [00:39:56] Exactly. Will you talk about that as well because, again, like I said, it's that query that I get frequently through the work that we do. And we have—we're always advocating that it's not an add-on. You're replacing something else with this new program, whatever it happens to be, this new initiative, this new endeavor to prevent that overload.

Russell Stevens: [00:40:17] Well, in education, internationally, we fight the teacher burnout.

Annalies Corbin: [00:40:24] We do.

Russell Stevens: [00:40:24] And in addressing that, we need to make sure that a subject is introduced in a way where there is a facilitation of allowing people to teach in a way where they take off the role of feeling they are the specialists.

Annalies Corbin: [00:40:46] Exactly. They're a facilitator of learning. Exactly.

Russell Stevens: [00:40:49] They facilitate. And so, in this curriculum, when you read it, you'll see there's a line that says that teachers or students should not be dependent on their teacher for their performance. They are the primary teacher. Hence, this is why we are burning the candle at both ends at the moment. We are for all 85 topics of this curriculum, we have done the following. We have sit on a Google Drive, draw from Google Drive the curriculum. We, then, have 3 to 11, sometimes 15-page elucidation that the students can pick up. And so, that's like what we would, in the old days, call a textbook.

Russell Stevens: [00:41:42] But this is not a paper-based curriculum. We are not going to print any textbooks. No corporate is going to make lots of money out of selling paper with marine sciences content on it, which, then, dictates that we will be using old outdated methods and ideas because that's on the paper that's being printed that was called the textbooks that, then, dictates what we learn.

Russell Stevens: [00:42:12] The next thing that we have is a PowerPoint that is prepared that the students can go through and look at images that we've tried to get a local illustrator to put together. And all of our illustrations, all of our content in the elucidation, we've tried to Africanize it in a way where it doesn't have the context of, for example, when many American textbooks launch into an entry of what is life like under the sea, they start with Titanic. Now, what does the Titanic mean for an African child in South Africa? Very little. At least to this group of people, with respect to all the people that did die in that event, and I'm very sorry that that ended up happening and all of the things that Captain Smith did and whatever that happened, that really isn't an Africanized content.

Annalies Corbin: [00:43:18] Correct.

Russell Stevens: [00:43:20] Plate tectonics, when we teach plate tectonics to a grade 6 or whatever, we do not want to start with the San Andreas Fault. We start with the African Rift Valley.

Annalies Corbin: [00:43:29] It has to be culturally relevant.

Russell Stevens: [00:43:32] It's contextualized to the South African country.

Annalies Corbin: [00:43:34] Absolutely.

Russell Stevens: [00:43:35] And that's elements on the PowerPoints and the illustration. The other thing we have is a glossary. So, every word in the—if I can call it an e-book textbook, when we scan

over it, we'll see there is a word, and you don't know the meaning, we've written a glossary for each of the words there. We, also, then, give a series of questions, which are likely questions that students can be asked. So, out of all of this, what we do is we've got a curriculum that the children can learn off of a cellphone. All of that will be off cellphone, and they'll be able to pick up through—we sent to via social media, WhatsApp, or Facebook. They can pick up on the PowerPoint, they can pick up on the glossary, and all that's needed.

Annalies Corbin: [00:44:31] So, it's ready to roll.

Russell Stevens: [00:44:33] It's ready to roll. And there are four pillars of this curriculum - marine biology, oceanography, humans in the oceans, and ocean ecosystems. Humans in the ocean looks at marine-protected areas, for example. Ecosystems will look at kelp forests. We look at the open ocean forests—not forests, open ocean ecosystems. And marine biology looks at the evolutionary process right from proteus through to mammals. And that is the basis of the animals. When we look at the oceanology section, we look at [indiscernible], and pH, and we've look at salinity, and we've looked at currents. And so, the oceanology, the physical oceanology. Then, you also touch on a little bit of physics, like the gas laws, Boyle's law, and so forth, so that if students are going to diving, they'll understand the basics of diving science.

Annalies Corbin: [00:45:30] That's really remarkable and incredibly robust. So, thank you very much, Russell, for taking time to spend with me. I have no doubt our listeners will be reaching out to you. I can think of a handful of teachers that I've encountered over the years that I know will want, "How do I get my hands on this? How could we possibly be able to utilize components of that?"

Russell Stevens: [00:45:56] Yes. So, if they go to education.gov.za or we call zed a, you then click on the curriculum button, and you search for marine sciences caps, you will find this document.

Annalies Corbin: [00:46:15] I will make sure that we go find it, and we put a link out there.

Russell Stevens: [00:46:19] And then if anyone wants to contact us, they can email me at russell.stevens@aquarium.co.za.

Annalies Corbin: [00:46:27] I'll also post that link as well.

Russell Stevens: [00:46:27] Good.

Annalies Corbin: [00:46:27] Absolutely.

Russell Stevens: [00:46:27] So, they can just send an email, and we'll hope to be able to connect with them, connect with you through your radio stream station, and we will be able to do whatever it takes to make—as the National Marine Educators Association states, to make the world of water, fresh and salt, known to deal with this incredible need, which is identified within the United States of America and many others, of ocean literacy and the need to enhance ocean content into curricula worldwide. And then, at the same time, many of the developing countries have picked up on the need to elevate student understanding, so they can participate within an ocean economy, the blue economy, which is looking forward to the future, and we need to do it wisely, we need to do it sustainably, and we need to do it gently.

Annalies Corbin: [00:47:45] And we need to do it. And we need to do it quickly. And certainly, as a maritime archaeologist, my own passion with the world of water, I certainly thank you for the work that you're doing. It's been a pleasure.

Russell Stevens: [00:47:59] Thank you very much. It's really been great to be able to have this conversation and wonderful to share what has meant so much to us that we've invested our lives and our hearts into. And we're really privileged that it's going to be a go ahead now in South Africa, one of the first countries internationally that has a curriculum of this standard.

Annalies Corbin: [00:48:21] Absolutely. Well done and bravo! And, again, thank you so much.

Russell Stevens: [00:48:25] Thank you. **Annalies Corbin:** [00:48:29] Yeah.

Annalies Corbin: [00:48:29] Thank you for joining us for Learning Unboxed, a conversation about teaching, learning, and the future of work. I want to thank my guest, and encourage you all to be part of the conversation. Meet me on social media, @annaliescorbin. And join me next time as we stand up, step back, and lean in to reimagine education.