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Initiative of and funded by the Australian Government Department of Education and Training

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Transcript of teacher reflection interview

Steve Grant with Daniel Seymour of Adelaide Botanic High, SA, formerly Heathfield High School, SA

Steve Grant: This is Steve Grant meeting with Daniel Seymour at the Adelaide Botanic High School. This is following up on the STEM Connections illustration of practice.

Daniel Seymour: My name is Daniel Seymour. I'm one of the STEM coordinators here at Adelaide Botanic High School and I have leadership around technologies, so that's Design, and Digital Technologies. And very fortunate to have started here at the beginning of last year and obviously came from Heathfield High School previously, where I was also a STEM coordinator in a similar position.

Steve: Daniel, what has happened after the project? Did the project continue? Was there another iteration of this STEM work? If yes, what had happened? If no, what were some of the blocks? What were some of the things that were preventing that from moving forward?

Daniel: The project has continued, and it's evolved through a few different forms. The first year we ran it we had really incredible success and engagement from our students. Their ownership of their work was beyond what we thought. That's sort of around how we structured the learning and that ran for a number of years. It's changed a little bit now; where previously it was a part of Year 9, our core STEM learning, and at this point it's actually evolved into being a part of a more of an elective program, where students can opt into it. We're three or four years down the track and it's still going on. One of the things that's come from this project was a bit of an offspin. Our unit was around a connection with Jurlique, who are a manufacturer of cosmetics, and we've actually connected with another local producer to Heathfield High School at Beerenberg, who make jams and those sorts of delicious goods. We actually used that initial model that we created this STEM Connections project and we tweaked it to also fit with Beerenberg. So Beerenberg we brought in at Year 8 and so then we had a continuation with students

experiencing this Jurlique learning in Year 9. So, for us, we got incredible value from that project. The fact that we could scale it to include both those middle years levels was really great for us. We had in those first years all of our Year 8 and Year 9 students doing these projects, so that was 150 students each year. So, yeah, we got great value from it.

Steve: Could you give us an idea about were there any changes in the school context that have occurred? Were they positive? Or were they negative? Were they neutral? What was the impact of those changes?

Daniel: There have been a number of changes at Heathfield High School, probably starting with change of principal. The principal left Heathfield about two years ago, and with a new principal comes some new priorities. But I think they've been able to really manage and maintain those strong industry connections. The school has been chosen as one of the few new entrepreneurship schools. I think that's great homage or recognition of the work that we're doing through these projects and now they're looking at entrepreneurship as not just an opportunity for STEM but an opportunity across all learning areas. I think that probably opens up opportunities for kids that excel in other areas not just STEM.

So, a couple years down the track with new leadership there, the school's also had a number of coordinators change over and some staff, but the project still occurs. They were still around this year as a bit of a choice subject and so students could opt into it knowing that they'll be working together in groups and working really closely with the industry or the organisation as well. I think given that we're a few years down the track, probably the structure we put around those tasks, they were planned to the nth degree to make sure we could have them work with 150 students and we had generally 10 to 12 teachers involved in each year level. So we had Gantt charts down to the lesson-by-lesson detail, all the assessment tasks were written up and reviewed and modified for the following year, but all that was built into our processes to ensure that should there be a changeover that we had all those resources there so that anyone else could come in and step in and run them. We shared a lot of our work with other schools as well. We were really trying to model the detail that we would expect other schools would need to be able to try some of this in their site as well.

Steve: But that's interesting, that there was so much thought going into the planning and then also what was going to happen afterwards, that it would sustain itself. Do you credit the planning and that level of detail to some of the success that you've had in being able to survive contextual change like leadership and like teachers moving on?

Daniel: Possibly, I think we probably weren't planning that at the time. I think it's just – reflecting back now – if we hadn't planned that work in as much detail, I could see that as opportunity for these things to fall down. They were structured so well. Just in terms of the operations, not necessarily in terms of what students were actually doing, we were trying to really leave that quite open ended. But yes, in terms of the operations of the work, trying to get that to the point where we could share it and other schools could step in, yes, I think it probably has helped.

Now at Adelaide Botanic High School; we've tried to take that a step further really in terms of how we're driving those connections. So, here our maths and science generally drive a lot of our STEM units, whereas often maths is kind of considered the 'add-in'. So we've really tried to place more value in that learning rather than it being a bit of an afterthought, which is often the criticism for connected STEM work, is that you'd end up doing statistics and measurement in maths because that's the only thing we can really connect [laughs]. I think we actually started from a point of, "What maths and science do we need to cover? How can we find some really purposeful connections in there?" So, yes, certainly that work at Heathfield has helped me along the way.

Steve: You've alluded to some of the changes that have occurred in your thinking around STEM. Can you reflect on how your pedagogy has being impacted? Thinking back to before the project to now, what has or how has your thinking around STEM changed in that time?

Daniel: My philosophy has always probably remained true in terms of STEM, is just a multitude of things. It's really a way of working and a way of thinking. I've tried not to pigeonhole what a STEM task can look like. I've tried to remain open to new ideas and opportunities. In terms of how … pedagogy focus, being in a new context now at Adelaide Botanic High School, we have a lot more collaboration between our teachers. So, team planning, but also team teaching and so that's probably been the biggest shift; is we actually are relying on the collective genius of our peers and we're actually learning from each other and we're modelling our previous experiences.

But we're learning from each other, even in the classroom, seeing how someone else would approach a particular situation as well. So that team teaching has probably been the biggest difference from me and we've gone from that point of, at Heathfield, it was still me and generally my class whereas now, it's me being a part of a team of three teachers and our three classes and having great flexibility in terms of how we divide up that time. And if a class needs to jump into some maths content to help reinforce their learning, then we can do that and the maths teacher can take that class off for a session or we can have them all together for a session.

We've got incredible flexibility in our timetable to try and take this style of working beyond where we had it previously.

Steve: You're a high school teacher by trade and by training. You must have experienced the siloed nature of high school education, whether you were subjected to it or you're part of that process. Has your thinking around that changed now as well? Our silos are the depth of discipline knowledge. Is that important? As important as what it was back then? Or as it is now? I'd like your ideas on that.

Daniel: Certainly my experience in high school would have been that silo model. I grew up in New South Wales, so I did my HSC over there. When I started teaching in South Australia, obviously some new acronyms to learn. But quite quickly at Heathfield we were really trying to explore those connections to try and make learning relevant for students, bring in those real-world connections and let them see the value of the general capabilities they're learning as well. So these were lifelong skills that we were trying to really build in amongst the curriculum.

I think here we've maintained that focus here at Adelaide Botanic High Schools, we're trying to achieve these STEM – I refer to it as a bit of a STEM unicorn – it's this thing that most schools haven't been able to achieve, which is the connected learning but maintaining that discipline or deep discipline mastery.

Often the criticism of integrated curriculum is that you lose that depth and the fluency that comes from the real focus on the discipline. So we're trying to find that balance between those things. It means at times prioritising particular things and needing to skim over others to create some time to actually put into and invest in that priority. It might be around algebra or it could be a particular part of a science inquiry skill, if that's our priority then we really focus deeply on that and make sure we achieve that in that project.

Steve: You mentioned before the industry connections that the school had made and the role that Jurlique had with the first iteration of the project and then Beerenberg coming on board. I'd like you to talk to me about those industry connections. Did they sustain? Did they improve? Did they impact the teaching and the quality of learning that the students were demonstrating?

Daniel: Absolutely. We were really careful in how we managed those connections and our relationships with our industry partners. We set up some protocols around communications. Our communication with Jurlique and Beerenberg would always go through one teacher, or it might have been an assistant principal. We were really trying to value their time and ensure they weren't inundated with emails. I think at one stage we said, at various stages of the projects, if

there were questions from students, we would bring them all together in one email and potentially every, say Wednesday, we would shoot through questions. So they would know that it was coming, and they were able to build that into their schedule as well. So we were really ensuring that we were valuing the commitment they were putting into our project as well. That was probably one of the key successes in managing those relationships.

My understanding is … our second year of this work, that was also maintained, and the feedback we were hearing from Jurlique and Beerenberg was that the engagement of our teachers, that was really motivating them to want to stay connected with the school. They saw the really incredible work that our Year 8 and Year 9 students were doing. As Jurlique would describe it, was probably beyond what they expected, and they actually made the comment that it was beyond what some of their employees would have been able to produce! So, just maybe in terms of looking at things a different way, bringing some creativity, but they were they were really blown away by the opportunity and the quality of what students created. So, a couple years on, still connected with the school. I think the way the school manages those connections now is a little bit different. I think it probably has come down to the teacher level, but how we started with those industry connectors was really critical to set them up and get them to the point where we could build some trust with each other as well.

Steve: So, you found that managing that relationship was really crucial to establishing and maintaining and sustaining the connection value.

Daniel: Absolutely, and it was also ensuring that each party was getting some value from it. You might think doing an industry connection project with the business that all they want is an opportunity to promote in the school, or access to some new market research but that was not the case. We were really fortunate that both businesses were just completely genuine in just wanting students to experience some new opportunities and essentially build some skills that they could take out into the workforce. And given that we were working with Jurlique and Beerenberg, who were local to the school, I guess they were thinking potentially that students actually might find their way into their workforce as well. So that was really genuine intent behind their connection with us.

Steve: I'm curious to understand who was driving the educational outcomes of it. Was it that Jurlique came in with a particular problem? Or something to solve? Was it Beerenberg that was saying, "Look, this is what we do, this is what you do. What can you do for us?" How did that dialogue unfold?

Daniel: It's really interesting. We had just made connections with Jurlique as we moved into this STEM Connections project. So for us the timing really was quite perfect. They'd connected with the school saying, "We're interested in working with you". STEM Connections came along and so we met with them a number of times just to essentially brainstorm what this thing could look like, what would they need for us for it to be worth their time, what would we need from them for it to work from a teaching and learning point of view. Those early meetings, we were really open to any ideas and it really just evolved over probably a couple of weeks, just meeting every few weeks and getting to the point where we nailed down what this looked like. It was in essence a bit of a Shark Tank experience for our students. They came up with a product they had to brand and market, but they actually made the product as well. So if it was a skincare product or hair wax, they actually in their science lessons brought in all the ingredients and made the product. Obviously, through their maths they were doing a lot of costing but also working out the surface area and volume of their containers as well. So, there was a bit of measurement work in there as well.

Steve: In reflecting on what's happened at Heathfield High School and thinking about the different silos there that came together, what connections still exist between those learning areas?

Daniel: The learning areas are still connected in the same way. There are only four learning areas at Heathfield, which is different to other schools. There's Advanced Technologies, which is the maths, science and technologies, what you might think of as STEM. There's Responsible Living, which is the health and PE. There's the Arts and there's also Global Living, which is the English, history, geography as well. So they've found natural connections between those subjects and brought them together under those banners as a way of highlighting the inherent connections for students as well.

Steve: You talk about those natural connections between learning areas. Was that something that you walked into and found that was how you worked? Or was it something that you actively workshopped, and developed and revisited? What were those connections? What were those things that you looked for between learning areas?

Daniel: There's a really interesting story around that. So, that work probably started about 10 or 12 years ago when Alistair Brown, the principal at the time, was starting to think pretty deeply around what the experience was of students at the school. So, he for a day met a student off the bus and literally went with them to every lesson across the day to see what it was that they were experiencing. Back then it was the traditional eight 45-minute lessons and he was really

concerned at that point that a student might have been in a maths session looking at trying to plot a formula on a graph, but then would go off to science and maybe look at plotting graphs there. But there was no connection between those things, and there was a lot of duplication. Kids were expected to change hats every 45 minutes and change the way they were thinking and what they were thinking about. It was a lot for them to take in. So at the end of the day they were exhausted and that was that old silo model.

From that work, really, we're asking questions of what does a student experience? How can we prevent duplication and try and make their learning more coherent? So that's where conversation started, and it probably took two years really for it to evolve into those four learning areas. A lot of change around pedagogy as well for our teachers. So, generally, Year 8 and Year 9 classes were put together in cohorts – a couple of teachers and a couple of classes – and they were generally a maths and a science and a technology teacher working really closely together to deliver that curriculum. So teachers were given the opportunity to think just outside their discipline knowledge and at times were expected to support and be involved in that as well. The learning of our teachers I think was quite significant, certainly outside comfort zones for a period of time there.

Steve: You've spoken about the connections that your school has made with industry. I'd like you to reflect on: what connections did you make with other schools? With other feeder schools in the area? What was their experience? What was their experience going both ways? You've spoken about industry and how there was more connections that were made through Beerenberg. Could you reflect on the other connections that you made?

Daniel: We really valued the opportunity that the STEM Connections project gave us in really giving us time to bring together some things we had been thinking about for a period of time. We were really keen to ensure we passed that on to a number of other schools. Within a few years of starting this work, Heathfield became one of the STEM focus schools in South Australia. So there was a requirement as a part of that to run some training or PD for other schools. We on a number of times would bring schools in to Heathfield and get down to nitty-gritty in terms of our learnings, our failures from this sort of work, and really trying to let people see the mechanics of what was going on so they could try and transfer that to their site. We shared all of our tasks, even the resources in terms of the Gantt charts, we were really happy to hand that over to anyone who would take it [laughs] as a way of sharing the opportunity that we had.

We probably didn't do a lot of work with connecting with our feeder primary schools and that was certainly something that we were starting to address. But Heathfield, up in the Adelaide

Hills, our Year 8 [i] students were drawn from about 26 different primary schools. There were potentially about eight or nine that were closest to us. But they all had their own priorities as well and we were probably just getting to the point of thinking how can we value-add to that primary experience and potentially have students come into us with some skills that would help this sort of work. But we probably didn't progress that as much as we could have.

Heathwood High School through this work has recently been announced as one of the entrepreneurship schools. As a part of that, they've had some Year 10 students in their – it's called the Shark Tank eSchool program – connections with Adelaide University.

Students are going through a very similar experience where they're researching and designing some sort of product. One of the Heathfield groups was looking at concussion in sport and looking at designing a – it's almost like a, somewhere between a headband and a helmet – it wasn't necessarily as obstructive as a full helmet but something that sportspeople could wear during sports to pick up on some of the dangers around concussion. Similar to the Shark Tank experience, students had to present their work to a panel through an expo-style presentation and they've done incredibly well. They actually won some prizes in their first year as well. So that's recognition of the work those students have been through in Year 8 and Year 9 and Year 10 now and really building some of those skills to send them off into the world and who knows what they can come up with down the track.

Steve: It's an interesting evolution you see happening there from business coming in, to then students going out to business and pitching that idea; that changing confidence must have been really interesting to observe.

Daniel: Yes, absolutely, it's probably been one of the changes for the school, just opening up opportunities.

Entrepreneurship isn't just about STEM; it's all learning areas and that's probably been the shift for the school. They're thinking STEM has been around for a while now and as a bit of a buzzword sometimes it gets a bad rap and they're thinking, what's next? They're certainly placing some value in entrepreneurship and if you think about the capabilities that come from that style of work, I think they're certainly setting up their students for success down the track, taking that pathway.

Steve: Do you feel like you have the skills or knowledge to plan and develop units in STEM?

Daniel: Yes, probably at the time it was quite new, but one of the great things was being able to again rely on collective genius of our colleagues. I think with each of these tasks we were able

to take them beyond where any one of us could have could have got them. We all came from a different point of view and we all had added value to them. We were really proud in the end of the quality of work that we were getting from students. It’s probably been the thing that's grown over the last couple of years.

Those experiences certainly helped me now at Adelaide Botanic High School. We've taken that a step further in terms of our team planning. We have a very unique timetable. Our staff meet for roughly 45 minutes every morning before students arrive at school. In that time, we do a lot of our curriculum planning but we might focus on other things. So, it might be focus on PDPs or assessment reporting or focus on pedagogy and workshops around ICT. We generally have two or three learning area sessions a week and that time is invaluable. It's really given us the opportunity to take that a lot further this year and aim pretty high in terms of the scale of what we're trying to achieve.

Steve: Did you rerun the project and what had changed from one iteration to the next?

Daniel: Yeah, good question. That first year with Jurlique, we were really, really happy with what we achieved. Students designed some sort of new product line potentially at Jurlique. What changed in the second year was that we wanted potential for a bit more student ownership around the product. So rather than it being a Jurlique-branded product we actually allowed students to come up with any product. They were bringing in deodorants and antiperspirants or conditioners, things that necessarily Jurlique weren't interested in making but students were essentially developing the same skills through that work. It was just that we felt that would ensure we're maintaining engagement all the way through, if the students had a bit more ownership.

My understanding is that's how the project continued in the third year. This was all of our Year 9 students doing this work as well, so about 150 students and now it's with the change in the school around entrepreneurship, they've moved this style of working into a new program and it's become an elective for students. I believe there's a smaller group of students completing this work now.

The project with Beerenberg came in at Year 8. We positioned that as a way of just sort of value-adding into the Jurlique work and we just scaled things down a bit. So the timelines were shorter, expectations of students were a little bit less, and we really tried to embed some opportunity to build some collaborative skills along the way because students were working in groups. So we saw that as opportunity really trying to prepare them for moving into Year 9 and

beyond as well. I'm not sure if the Beerenberg project ran this year but it certainly ran for about three years.

Steve: Thank you so much for your time.

Daniel: My pleasure, thank you very much.

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[i] At the time of the interview Year 8 is the first year of high school in South Australia. (This will remain the case in SA until Term 1, 2022 – the last state in Australia to move Year 7 out of primary.)