**Leanne Compton** - Hello, my name is Leanne Compton and I'm the Curriculum Manager for Design and Technologies at the Victorian Curriculum and Assessment Authority. With me in this video is the incoming State Reviewer for VCE Systems Engineering, Chris Simpson, and also the outgoing Systems Engineering State Reviewer, Colin Chapman. This video is one in a series of videos that the VCAA is developing to support teachers of VCE Systems Engineering. This particular video, we're focus in on developing School-assessed Coursework and making links to VCE assessment principles. Over to you, Chris.

**Chris Simpson -** Thank you, Leanne, and welcome everyone. So, this presentation is going to be based around School-assessed Coursework, or SACs. In Systems Engineering, we have two areas that we explore in our SACs, the first one is renewable and nonrenewable energy technologies and the second one is new and emerging technologies, but we'll give a brief overview to start with. So, the assessment for this should be ... show the progress and achievement of our students and it must be accessible, effective, equitable, reasonable, and transparent. And the idea behind SAC work and SATs is to rank your student cohort within their class. The ranking of your cohort may differ between the SACs and the SATs, and also there'll be different to the assessment that will be done at the end of the year, so the examination. So, you'll have different levels of achievement in each of these areas. So, they are regarded as separate graded assessments, and the SACs, SATs, and exams can be different type of assessment so you should not expect the same mark in everyone. You may find that some students will perform well in the exam because that's the preferred means of assessment for them, whereas working on their SAT or the School-assessed Task, they may get distracted with things going on in the classroom or during the school year. So the VCE assessment principles, they should be valid and reasonable. The curriculum that you assess your students on is explicit in each of our study designs, so our specific one for Systems Engineering, and it's related back to VCAA documents. Assessment instruments should not assess learning that is outside the scope of a study design. The assessment should be equitable and they shouldn't privilege nor disadvantage students or exclude them based on gender, culture, physical disabilities, socioeconomic status or geographical location. As VCE assessors, our assessment should be balanced. They should give the students a range of opportunities to demonstrate showing different contexts and modes, the knowledge, skills, understanding, and capacity set out in the curriculum. The demonstration at different levels of achievement should be specified by suitable criteria, descriptors, rubrics, or marking schemes, and they must be supported. So we must be able to take our cohort and rank them, but not discriminate in any way for learning difficulties or specific areas that they have knowledge in.

**Colin Chapman -** Now it's important that, when looking at this principle of balance, that we develop rubrics which have a range of response possibilities for the candidates. So, these possibilities would go from listing type activities through to explanation and discussion right across to justification and creation. So, the rubric should really reflect the expectation that will have students who will be responding at different levels, and these aren't marked based, they're quality of response based.

**Chris Simpson -** So our study design sets out minimum assessments for the teachers and allows them to make robust judgements about each student's progress and their learning. Demands for specific and precise answers must be balanced with those for effectiveness and efficiency of responses. So going back to Colin's rubric creation, again, we need to have that balance across all our columns that we may create within our rubric. The activities that we design for our students should be engaging, provide a good stimulus for our students to discuss and work through the various aspects that we're looking at, and allow some form of personalisation with regard to our mandated outcomes. So, there should be a good opportunity for all students to demonstrate this and be able to obtain a satisfactory or an S grade. I often see, with my students, that I liken the experience of doing the SACs to being at a dinner party and you have a knowledge of a subject matter and you're able to express that. So if we can get our students to be able to demonstrate an understanding of what they- a deep understanding of the content in this, that's what we're trying to achieve.

**Colin Chapman -** And School-assessed Coursework should be an important part of your learning and teaching programme. It's a design process for the teacher and students should be made aware of the sorts of things you've thought about when you're designing these stimulus activities, so that you can personalise the responses that the students are able to offer.

**Chris Simpson -** So, one thing that's really good with these SACs is we can actually make them very, very, very real world. So, we don't just think about containing our knowledge and understanding and learning to within our classroom environment, we can take our students out and go and visit real locations. We could enable a virtual tour of say a factory and try to engage our local community around us in these activities. So for example, it may be doing investigations on local factories where they've installed solar panels or some form of geothermal systems, regarding the SAC in Unit 3. It could be going and looking up virtual reality technologies that are used to mitigate traffic accidents with trams. So, other ways that we can explore and bring in those real world scenarios into these two SACs within our classroom.

**Colin Chapman -** And it's an opportunity for the assessment to allow students to go from just receiving information and knowledge through to creating understandings and really engaging with systems engineering concepts as they work with the stimulus material. So, assessment can be thickened with experimentation and demonstrations. They can be real, they could be virtual. So when we're looking at the SAC that is concerned with energy, the students can read about NOx scrubbers when they're looking at cleaning up emissions, but it would be better if the students can actually experiment with the whole idea of NOx scrubbing, so to work with the science department in your school, and for the students to evolve NOx and then to make a model chimney that's packed with activated charcoal and other materials to show how the increased surface area of activated charcoal allows the capture of these sorts of chemicals is certainly a much more profound way of exploring the concept of scrubbers rather than the students simply reading it in a book or some sort of text. So, this SAC activity can be a doing activity and it's important that we try to design that into our SAC opportunities as part of our stimulus material.

**Chris Simpson -** And the other good thing about this, our SACs in Systems Engineering, is we can actually engage previous students that we've had on our courses. So for example, I had a nice chat with Colin earlier and he mentioned that one year a cohort came through that had a very active interest in prosthetics and a number of them have gone on to work in that field, so potentially you could invite them back and see the various ideas that are trying to bring into their field of expertise. So rather than just prosthetics that are attached to limbs, I think Colin mentioned that they had instrumentation within them, so rather than just being effectively a dumb prosthetic, it had some form of data generation from within the limbs. So again, we can start making things real, and if you do still have contact with previous students, see if they're willing to come in and actually do a presentation on their area of expertise. So again, going back to- Relating our SACs back, potentially, to our SAT, we can also start to do simulation and/or modelling. So, with the NOx scrubbers you could come up with a model and see whether our actual physical model relates back to what we expect. So again, it can be a blended thing of virtual and real and see whether our devices do what they need to do.

**Colin Chapman -** And this is a really good example of using skills that we're developing as part of their working with a study design and using it to allow the students to experiment with those skills and concepts in other forms of school-based assessment.

**Chris Simpson -** So when it comes to presenting these ideas, we can move away from the traditional way of folios and printed things. So if the students want, they can create videos, images, some form of experimental dialogue with what they've tried to achieve and seeing the results. Potentially, they could have gone externally and sought out an expert in a specific area and conduct a small interview and put that together, so we can have a blended mode of assessment for this. It doesn't have to be, or it shouldn't really be, a class test. But, we have to be able to allow the students to demonstrate that deeper understanding of some of the things that you could have used as a stimulus. So with this one, really encourage students to make multimedia presentations. And again, this can also start back in Unit 1, 2, it doesn't necessarily just have to come in at 3, 4. So some of the outcomes in Unit 1 and 2 could be video presentations. So again, Unit 3, Outcome 2 in one of the key SACs that we do and it's being able to look up renewable and non-renewable energy sources. And again, we're really going to pick out and distil the things, so it's that ability to discuss the content, so advantages and disadvantages, and then analyse, evaluate the technology, they choose to generate electricity. So again, it's being able to present cases, present proper data associated with those, give a critical evaluation and then give an overarching statement of what you've found.

**Colin Chapman -** And just to also clarify, structured questions. So structured questions are a way that a teacher can scaffold deeper responses to stimulus material. It's not a quiz. It's a way that the teacher can help students explore concepts in such a way that they can deepen their capacity to respond in higher order ways.

**Chris Simpson -** And in Unit 4, the second outcome, Outcome 2, is the new and emerging technologies. And the key thing again, with this, is evaluate or look at a range of different ones and then analyse the impacts, specifically over selected technologies. So, you'll find that students will have a natural leaning towards certain areas that they may be interested in, and this is a brilliant way to get that student to show their depth of understanding it, so a really good way to say, okay, now is your time to shine and show us exactly what you know about this area. So those deeper level responses would be what we'd expect in this. And again, if they can produce a video, it's fantastic.

**Colin Chapman -** And something I've done in the past too, Christopher, and we've had discussions about this as well, is that students can do this in a seminar format as well. So, it allows the students to engage in processes of critique and evaluation in the lead-up to some final artefact they may produce. So, it's an opportunity for the teachers to build-in the development of skills that allow higher order responses as they're going through these SACs, because we have to remember that school-based assessment is an integral part of their learning and teaching activities, it's not an add-on, that is separate.

**Chris Simpson -** Yeah. Well, well put Colin, yeah. So, that ability to bring it all together and make something real out of it is fantastic. So again, there will be a webinar with a Q&A session related to this video, sometime in Term 1. Dates and links will be sent out through the VCAA February Bulletin. And if you do have any additional questions or you require information or clarification, please don't hesitate to contact Leanne Compton at the email below.

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