Welcome back to this short set of videos that have been looking at the development, construction and detail of a problem-solving or modelling task for Unit 4 Further Mathematics and the matrices module.

In the first few videos, we discussed the context, the construction of the task how it developed through three parts. And now we're looking at the assessment of that particular scenario.

The assessment itself, of course is linked to the three outcomes and the three parts. How you allocate marks to each of the parts, of course, is up to you. And whether you want to place emphasis on a particular part over others, whether you want to place emphasis on a particular outcome in one of the parts over the others. The numbers that you can see in this particular table on the screen at the moment is a random allocation.

I wanted to give some importance to Part 1 for Outcome 1 and Outcome 2, but not so much for Outcome 3. I want to then utilise Outcome 3 a little bit more in Part 2 and Part 3. Of course, Outcome 3 is to do with the technology that's involved in this particular task. As I said, this, you can decide upon depending on your cohort you may decide to put more emphasis in Part 1 where most students can access that particular part and diminish the importance of Part 3 where you believe only a few of your cohort may get to and investigate that scenario. Others may have a very strong cohort and therefore downplay Part 1 and increase the level of importance of Part 3. But as I said that's just something you can work your way through.

Once I've decided on the allocation of marks to each of the parts, it's then a matter of going through and working out how I'm going to assess each of these parts what I'm looking for in the task itself. And this needs to be quite global and subjective in terms of some of these allocations. Of course, if you've got a large cohort and you're trying to get some consistency amongst each of the classes that are there you might need to be a little bit more specific about certain places or areas that you would like to concentrate on regarding each of the dot points that we're going to put into this assessment rubric. I've put in one dot point for most of them, just to give you a thought of how and why I might be doing that. But of course you would complete other elements of the task by putting in other dot points for each of these areas.

So the conventions that's part of Criterion 1 I've just looked at the matrix notation that they're using throughout. Has it been labelled properly? Are they referring to state matrices and recurrence matrices correctly? Is all of that symbolism correct in terms of the way we would think it should be set up and how they've actually gone and used it? And therefore I would look for that globally throughout the task. As I said, you might decide to pick certain aspects of the task where that's going to become a major feature or an area, but certainly that should be part of each of the scenarios that we set up, Part 1, Part 2 and Part 3, in terms of their use.

So that's just one of the dot points, but there should be others. Remember there's only one mark allocated to this throughout the entire task. So it doesn't need to be an extensive set of things you're looking for, but really about the notation and symbolism that's being used throughout.

In the second criterion, you'll notice this is the definition and an explanation of key concepts. So I've talked about defining a transition matrix correctly the idea of a regular transition matrix and having the columns adding to one, setting up scenarios where if they're picking random values for 'a's, b's and c's that they're stipulating that the content, sorry, the column needs to add to one. So anything where they're defining or explaining some key ideas would become part of that particular dot point. Again, you would add others to that one that I've suggested or you might even change that one that I've suggested.

And then we go to Criterion 3, which is the accurate use of mathematics. So this is where they would get correct answers a little bit like your exam style, where you're looking for correctness in what they've actually done. And I've talked about them correctly calculating the state matrices and even the long term. So there's many scenarios where that can be implemented. And of course you might break that down into smaller components. So you're looking at specific aspects as you go through. And this is only two marks out of the allocation of the whole task. So it's not a big area of assessment and that's the way it should be. It is a problem-solving or modelling and it's not about making sure there is correct mathematics as the major focus as we go through.

As we move into Outcome 2, now we're looking at the three scenarios or components. Again, the criterion for first outcome of two is to identify the important information a little bit like the Criterion 2 in Outcome 1. As I said, the totals adding to one might be one element, the total number of members needs to remain constant after each state calculation so just making sure that that's part of their calculating process. These are the things that you would picking up as important with their work as they're going through, and of course, marks can be allocated to it.

The two main areas of assessment are really Criterion 2 and 3. This is where they're applying the mathematics and then analysing and interpreting. The application of the mathematics is purely out of the study design, so those dot points that we were listing as we were going through. And if they're applying it correctly then that criterion could be marked quite highly. Remember you are trying to split this over each of the parts to ensure that there is some use of mathematical ideas throughout the three parts.

And of course the analysis, I think as we start to differentiate between those who can summarise the material, they've come up with and give you some suggestions regarding the review of this particular fitness centre. And that's always seen to be the criterion piece that can be used as a good differentiator between each of the students in your cohort.

The technology part at the end is then how they've used it. And of course, this is going to come into the three parts. Quite often, I talked about the construction of the recurrence relations, how they can actually set it up on their calculator and being able to set it up to me is a high-end learning skill. Using then the calculator to go and get answers to that scenario either through a recurrence level or the long-term general solution, that's a good application of technology.

So there's two areas, and again, you can split those up even more to make them far more specific so that you've got far more items to look at throughout the task. And again, there's only two and three marks respectively that are allocated to these two criterion. So there's not a lot of marks over the entire task where they've spent two to three hours setting all of this up. But it does give you now a far simpler way of trying to assess each student's work and what it might actually look like.

Once all of those dot points have sort of been filled in, then you can go to the actual rubric and of course start marking it. But I think this is the important element of the assessment of being able to allocate items to each of the criterion, what you're looking for, where you might be looking for it and how you would judge one student's work to be better than another.

The rubric itself is the one that's often on the website, that's the sample assessment task. And I think this is quite an easy one to then go and fill out the allocation of marks, as I said, was based on each of the criterion pieces that we were looking at and very simple to then go and record.

So you can see that the emphasis of assessment is very much on the rubric and allocating certain levels of thinking to each of the parts via the criterion or of a global thinking rather than a specific or an explicit allocation, which again is a shift in mathematical marking, what's generally done, but I think it's a good shift. These problems generally do give students to get them to explore ideas and get them to extend their thinking far greater than what examination questions do, and therefore deepen that understanding which is exactly what we want from these tasks.

The resources that we're looking at, or you looking at here will be available in the Advice for teachers both the video and the sample task itself. So it just gives you an opportunity to be able to go and look at those to review what we've actually talked about.

Thanks for joining me on this journey of developing and constructing this particular problem-solving or modelling task. And I wish you the very best in your construction. Thank you.

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