

DIFFERENCE BETWEEN SECONDARY AND TERTIARY - DO TEACHERS KNOW?

I think that we don't.. we haven't got a lot of uniformity amongst schools in presenting to students what to expect at university, and I don't think the universities do that brilliant a job in feeding back to schools what they want...I do believe that, where schools are trying to find out what's required at university.

DIFFERENCE BETWEEN SECONDARY AND TERTIARY – A WAY TO FIND OUT

I think it would be really useful from my point of view to actually meet with a lot of the people who get our students, and say to them ‘what are the things that we are doing that are really good and what are the things that you would like us to do more of?’

DIFFERENCE BETWEEN SECONDARY AND TERTIARY – DOES IT MATTER?

I wouldn't know. The task of a secondary school is to follow the curriculum. Occasionally I would divert and teach something slightly different, beyond the curriculum, but I don't do it often.

ASSESSMENT – THE REALITY

- The type of questions I give them is similar to that they will receive in an exam or an assessment.
- I think that the internal assessments...because you know what you're going to be assessing them and because of time constraints, you can teach the content that's in the assessment. I'm afraid that that's the sort of thing that has crept in.
- Let me think of an example, let us go back to my expectations with the majority of the class, if I'm aiming at achieved or merit I might skip out the excellence part work at the end.

NCEA AND ITS EFFECT ON ASSESSMENT

- It's a different system, NCEA they can say oh that's an excellence question, I won't worry about that, I'll just work at merit/achieved. Whereas at university they have to do the whole lot, and so in that way NCEA can be a problem for students that want to work a lower level and are thrown hard problems at university.
- I have seen the students going more for achieved level, and no one, not many of them are working at excellence level.

TEACHING STYLE – TEACHER OPINIONS OF THE TERTIARY SITUATION

- “Tertiary students are taking more responsibility for their own learning. Teaching style is more teacher-centred”
- “less personal interaction with students”
- “Attendance at tutorials at university may alleviate or moderate the ‘clinical’ nature of lecturing.”
- “Large course sizes at university prevent interactive investigative approach to new material. Difficult for students to ask questions”
- “more lecturing rather than teaching.”
- “Teaching is more detailed in Year 13 than in the first year tertiary calculus”
- “more technology and lecturing” at tertiary level.

COMMUNICATION WITH STUDENTS – A CRITICAL CONCERN

- Teachers indicated that the communication between themselves and the students was of paramount importance to them, and there were many comments in the interviews that supported that.

TEACHING RESOURCES - TEACHER OPINIONS OF THE TERTIARY SITUATION

- The perception: tertiary institutions have far more resources than secondary schools.
 - CD resources
 - Textbooks
 - Access to computers.
- “Universities usually have much better computer resources”
- “Mostly technology based”
- “A lot of good clearly explained textbooks.”

WHAT IS LACKING IN SCHOOLS? – TEACHER VIEW ON THE MAJOR CONCERNS

- The greatest is time
- Available resources
 - Computers
 - Computer software

TEACHING EMPHASIS

- Is there a difference?
 - “I don’t know”
 - Greater depth required
 - Emphasis on theory
 - A more formal approach
 - Different approaches to sections of the syllabus
 - Different topics included
 - More pure and less applied

NCEA AND THE EFFECT ON TEACHER EMPHASIS

...students who are less capable struggle to understand maths unless they can fit it into a practical situation then everything we do needs to have a direct link to a practical situation, and that isn't mathematics in my view...If we keep on going this way... then we'll actually lose what mathematics offers, because it will become so simplistic ... And that's scary for me, that it's all going that way, that we're getting out of the theoretical mathematics.

TECHNOLOGY - TEACHERS' PERCEPTIONS OF THE TERTIARY SITUATION

- In tertiary use of technology is much greater than that of Year 13 teachers except for the use of graphic calculators
- “GC (graphics calculator) is not used at university”
- “Tertiary - also online access of notes, assignments, use computer programmes.”
- “Vast resources”.

- Whereas at Secondary
 - The lack of access to computers
 - The increasing use of data projectors (PowerPoint) in school teaching
 - The use of graphic calculators.

TECHNOLOGY AT SECONDARY SCHOOL

- My belief is that in calculus or senior mathematics we are trying to help them become analytical thinkers... I think that calculators are undermining what I'm trying to get through in a subject like calculus.
- I haven't personally used a lot of technology apart from calculators, partly because of difficulty in getting time on the computers. Programmable calculators allow the students to do problems that they don't really understand.
- The technology I use is: data projector, I use the overhead projector, we've got the graphics calculators, computers for generating simulations and – yeah the [inter]active whiteboard is in my room but so far I haven't learnt how to use it.
- It [technology] has a significant role in teaching and learning and I have some reservations about the use of technology in assessments, because I am concerned that technology can mask real knowledge.

TEACHER PREPARATION

- The predominant issue is time and workload—particularly administrative workload.
“If you’re tired and you’re run off your feet because you’re doing your reports and ninety thousand other things.., you don’t prepare.”
“My workload definitely affects the way I teach.”
“The workload affects my teaching to the extent that I’m not entirely happy with the quality of teaching I’ve been able to do.”
- And yet teachers say preparation is very important.

CLASSROOM MANAGEMENT ISSUES

- “Preparation time; behaviour of the students and the lack of respect... A lot of your class time is spent on managing the class.”
- “...the teaching time is just about 5 or 10 minutes during a period, and the rest is spent on giving them some tasks that they have to do on their own just to keep them quiet.”

THE TERTIARY SITUATION – TEACHERS PERCEPTIONS

- Tertiary lecturers have more time to prepare and also have more time to work together at departmental level.
- “Possibly more support/preparedness at university and perhaps time.”
- “University has more access to support for resource preparation.”
- “More colleagues and departmental discussion at university. Less pedagogy-driven and more mathematics-driven at university.”

THE STUDENT EXPERIENCE

- More teacher-student interaction at school than at tertiary level
 - “Closer teacher/student relationship at school.”
 - “Suspect that teacher-student communication would be considerably less at tertiary level.”
 - “More self-motivated in university”
 - “Tertiary students studying maths are usually more motivated than Y13 students.”
- Lecturers don't need to take responsibility for their students' results but secondary school teachers see their role as supporting students through the learning process and giving them opportunities to revisit work.

DO STUDENTS HAVE DIFFICULTIES MOVING FROM SECONDARY TO TERTIARY CALCULUS

- “I don’t know” 50%
- Yes 25%
- No 25%

“Students should aim higher to get merit or excellence as the tertiary education assumes they have a sufficient knowledge of Yr 13 calculus.”

“Study skills and self-discipline is the main requirement.”

THE LECTURER/STUDENT

- Lack of one-to-one help
- The quantity of information in a lecture
- Understand now versus understand later

“The transition is a change of learning cultures from hands-on to hands-off—all part of the learning curve.”

THE TRANSITION – STUDENT KNOWLEDGE

- If calculus is well taught at school, the first year of university calculus can be ‘too easy’

“Only if it were properly taught at school first year university mathematics is sometimes easier than L3 maths and there is little challenge for the top students in first year. As a consequence, second year exams are a bit of a shock.”

DO TEACHERS CONFUSE TERTIARY WITH UNIVERSITY?

- Class size
- Student- lecturer interaction
- Technology
- Lecturer responsibility for students' learning
- Pure mathematics versus applications