



## What psychology can tell us about teaching in higher education

*Transcript of recorded interview: Agnes Bosaquet talking with Penny Van Bergen and Alissa Beath (July 2022)*

**Agnes Bosanquet:** What I'm interested in is a couple of key concepts or a few key concepts that offer an insight for people in other disciplines. So they're explained in a way that someone who doesn't know psychology can go, all right, that's a useful insight for me into thinking about higher education teaching and learning. And I'm using the idea of concepts really broadly. It could be, you know, a concept and method, a theory, anything that's kind of an idea from psychology.

What we discussed was about breaking it into understanding learning and understanding learners. What I thought might be useful is if, from a psychology point of view, you could explain to me what learning is.

**Penny Van Bergen:** Yes, look, that's a big question.

I guess in distilling it down, when we're talking about learning fundamentally we're talking about a change in understanding, knowledge, or skills, where you've undergone some sort of change in your knowledge or skills. I think in terms of understanding how learning works that's what psychology can really offer to higher education. So, understanding that we have limited capacities in our brain.

We talk about this kind of magic number seven, for example, that your working memory can hold seven pieces of information at once. And that varies from person to person - there are individual differences there - but straight away, knowing that there's this sort of limited channel by which information can pass through means straight away that we need to design materials in a way that we're able to focus on specific things at once and not be overwhelmed by too much information.

**Agnes Bosanquet:** You mentioned working memory, can you say a little bit about what memory is as far as psychology understands it.

**Penny Van Bergen:** Yes, so psychology understands memory, as our capacity for encountering, managing, processing and storing new knowledge and skills. That includes conceptual knowledge. I think there's a misconception that it's just about rote recall and it's sort of these dry facts that we don't need in the future, but essentially, everything we know - everything we know how to do, everything we know about the world, everything we know about ourselves - is held within memory.

So understanding how it works is really important. We have - and this is a sort of simplified mode - but we have ways of getting information into the brain through our senses. Really, where we start to process and think about that information is in working memory so working memory is bringing in information from the environment. It's also bringing in information that we already know from long term memory. It's looking at, you know how do we process, problem solve, encounter that new information. And then, if we're going to hang on to it, how do we get it into long term memory . So long term memory is this enduring store of everything we know. We're not conscious of it, anything that we're thinking about is working memory. Anything that we're putting away for later is in our long term memory.

Does that explanation hang together, Alissa?

**Alissa Beath:** Yeah. So working memory is like what you're consciously aware of at any time. Things that you're consciously thinking about that is your working memory. Whereas stuff that you remember that is in the back of your brain but you're not actually thinking about it right now, you can think about that as your long term memory.

**Penny Van Bergen:** Yeah so any cognitive activity - problem solving, decision making, essentially anything we want to do it university all - of that activity is happening in working memory. So that's it. The better we process information, the more elaboratively we manage it in working memory -which means thinking about it in a deep expansive way - the better we encode it - which means the better we are getting it from working memory into long term memory, so that we can bring it back later again.

**Alissa Beath:** And part of our job as educators is to get students to make that transition from the working memory to their long term memory, so we need to think about how we teach them in a way that lets them actually facilitate that process or help that process as best that they can. While there are differences between students, there's very consistent ways that you can get information from your working memory to your long term memory and so part of the way we teach should be helping students to do that as best they can.

**Agnes Bosanquet:** So what does that look like for a teacher?

**Alissa Beath:** Thinking about getting students to engage with information in a deep way, to actually think about it, to actually integrate, and to make connections between the different things that they're learning. Something that students often think is an effective way of studying is going over something over and over again - rereading lecture notes, rereading notes that they've made, rereading a textbook - but that's not a very effective way of actually engaging with the material a bit more deeply and actually getting it into their long term memory. And so the more connections they can make between material, and the more they can really think about what it is that they're learning, rather than just read information that's on a page, the better that process is going to work.

**Penny Van Bergen:** I mean that that kind of process of rereading is really a shallow way of processing. And within the literature there's two ways of defining deep processing. One is elaborativeness, which is what Alissa is talking about when she's talking about making

connections between material and other types of material, you know thinking deeply about it, problem solving with it. The other is called distinctiveness of encoding but it actually gets further defined as just difficulty of decision making, so where you have to encounter challenging problems, and you have to really think about them. Both of those, that elaborativeness and that kind of difficult decision making, is what helps get material from working memory into long term memory. And that's really what we're talking about when we're talking about learning – the change in long term memory.

**Agnes Bosanquet:** So, as a teacher, what are some of the things that teachers can do that help with that process? Rather than just say to students go and read the textbook. I know that's something that happens in school education, like the process of 'go and study' is do some highlighting or, whatever, reread your notes. What are other things, what should teachers be telling people?

**Penny Van Bergen:** I think there's three things that I can think - Alissa might have others as well.

I think one is knowing that working memory capacity is limited, so you can only do so much at once. You want to design activities where the full attention is on that specific activity and that you've given students the resources and materials they need to not get completely lost. That's that kind of getting the difficulty right where it's not so much that you get lost, but it is enough that it's going to be challenging. That's the first thing.

The second is design activities that require that deep thought, you know, that require decision making and elaborativeness, and not just kind of rewriting notes over and over and over in a really shallow way.

And I think the third, which is often counterintuitive for higher education teachers, is that that process of elaborative difficult decision making is really helped by having some existing prior knowledge. I think we sometimes have a tendency of 'let's throw students into the deep end' and get them to just kind of think about things that they don't know yet, and that will lead to learning. They actually do a much better job if we've already got some knowledge there. It's this kind of cyclical process of building up base knowledge - that foundational knowledge is really important - but not stopping there, going further and requiring the higher order thinking on top of it.

**Alissa Beath:** And I'd also add in that it's not that reading the textbook is a bad thing, like there's a lot that you gain through that, it's that that's not sufficient, and that's not the best way of going about it. I think a lot of our students are quite time poor, as a lot of us are at the moment, and so if you think about them having a limited number of hours that they spend studying on any one of their subjects – where they're taking multiple subjects at once - then doing the best thing that they can to get the most out of their study time is going to be the best, the most beneficial approach for them. So them spending three hours rereading a textbook is not a very good way of spending their time where they could spend half an hour reading a textbook and two and a half hours doing these deeper exercises to really encode the information.

**Agnes Bosanquet:** So when we were making some notes and talking about it, you mentioned active versus passive. What's that?

**Alissa Beath:** So passive learning is things like rereading the textbook, rereading the lecture notes, things like that. Active strategies or active learning strategies are more about applying what they've learned to a new situation, doing something that actually leads them to think about it and apply it to a new context and new example. Work outside the box a little bit. So those things that Penny was talking about before about kind of expanding and not just reiterating over the same things over and over again, but applying it to a new problem, a new context and thinking about it in a different way. That really lets them, I guess, have a new opportunity to apply the things that they've learned.

**Penny Van Bergen:** Yeah so passive means you don't really actually have to do anything yourself, you're just kind of encountering the information. Whereas active means you have to do something with the information. You don't have to do anything with your body - it's your brain that's doing the activity, which sometimes gets mistaken as well. But if you have to make a decision, or you have to organise something in a particular way, or you have to generate your own example, that kind of notion of you have to do something - that's active learning.

**Agnes Bosanquet:** So the other thing I was thinking about was what are some things that people in higher education might believe about learning that you think are false? What are some of the myths?

**Penny Van Bergen:** Learning styles. Absolutely.

I wouldn't rely on just what we believe, you know, there's very good empirical evidence that learning styles are not an accurate way of representing how human cognition works. We have the capacity to think in all of these different ways. Look, the most common learning style myth is that we have visual learners and auditory learners and kinesthetic learners who learn best by movement. And, you know, if you ask people everyone answers that they are visual learner because everyone likes movies better than textbooks. What a surprise.

But our brain processes all those kinds of information, right? It simply does, unless there happens to be a particular impairment, we encounter information in all these channels and we turn it into meaning ourselves. There's also kind of experimental evidence that shows if you design learning style interventions, they don't actually support learning. So rather than thinking, what kind of learner are we, I think we think about what diversity do we actually have within the class because it's still important to differentiate.

What diversity do we actually have and how do I match the kinds of activities that I'm designing to what I want students to know?

**Alissa Beath:** I think there's a there's often a disconnect between the thinking that students are different people - and they are, every person is different, every way that they approach their studies, the way they think about studies is different - but that's not the same as saying that the process of learning is different. The process of learning is actually really,

really similar across any human being. A couple of exceptions, but for 99% of people, the process of learning is really similar.

So even if students feel like they prefer one way of learning to the other, or they prefer one way of revising or studying or one kind of activity to the other - that might have an impact on their learning in other ways. That might affect their engagement, that might affect their motivation, and those things are really important. But that's not the same thing as saying that the process of learning actually differs from student to student, because it really doesn't most of the time.

**Agnes Bosanquet:** Yeah okay, that's really clear. I really like that. It's probably a handy point to start thinking about learners because you've mentioned a couple of things like motivation. How can psychology help us understand learners as opposed to the learning process?

**Alissa Beath:** I think what I sort of said before, thinking about how every person is different and how they approach their studies is different, and particularly today. The motivations that students have for doing a degree, for studying in higher education, varies a lot and it's important, I think, that we as educators are aware of that. But, making sure that we teach them in a way that we know is best for their learning, rather than what they think is best for their learning. Because, ultimately, there is a science behind learning and we are the scientists who understand these things. And so, using our expertise and the scientific bodies' expertise to teach students in a way that we know is the best thing for them, rather than what they think is the best thing for them. There's a whole lot of reasons that change or that affect what they think they want to do, or what they think is best for them.

**Penny Van Bergen:** I have to give an example of that. You know, if you ask students for their judgment of learning so how much they think they've learned about something they will invariably say that they've learned the most from the easiest tasks. But the evidence shows that they've actually learned the most from the more challenging tasks, right. I think we do want to want a student voice, and we do want to give students kind of appropriate choices, and sort of opportunities for feedback, and opportunities for sort of supporting their own learning, but I think recognising our knowledge as experts who do understand what learning looks like. That might mean explaining what challenge looks like to students and that it actually feels uncomfortable but you're getting these really big gains. I think recognising that role, like Alissa says, is really important.

**Agnes Bosanquet:** So can I go back a step and just ask you what motivation is?

**Alissa Beath:** Hard to define that, Penny, have you got something to go to?

**Penny Van Bergen:** Motivation is, I guess colloquially, sort of the push or pull towards or away from a task, right. So when we're talking about motivation for study we're talking about the reasons that students want to and will try to do well.

I think you know that varies - some students want good grades, some students want to be a particular professional when they emerge from university, some students are doing degrees

because their family thinks this is the best degree for them, you know, there are a whole host. I think, also recognising that often these reasons are tumbled up with each other. You don't just have one or another, so I think the reasons that students are studying are really varied. And I think alongside that kind of that motivation for study - and that drives different kind of attitudes to study, right. You know, somebody who just wants to get through is going to approach study differently to somebody who desperately wants HDs across the board.

So that that drives sort of different approaches, but the other thing that is sort of relevant there in thinking about motivation is self-efficacy, so whether you think you can do something or not. If we're thinking about study, it's not enough just to want to do well, you have to believe you can as well, and so students' own belief about their capacities intersect with motivation to drive learning behaviours.

**Alissa Beath:** I would say, also with motivation, I think there's different things that you can be motivated to our students can be motivated to. Often, I think students are motivated to get a degree or to have that end achievement of actually achieving the entirety of their degree, but that often looks quite different to being motivated to studying for a specific assessment task or motivated to attend the class or to attend the lecture. And I think often them thinking about that bigger picture - and that these are the little steps that get them to that bigger picture - can help them to increase their motivation for doing the smaller things which are not very rewarding in the moment often.

**Penny Van Bergen:** Yeah and I think recognising that they've got motivations outside university as well, right. You might want to go to class but you've also got work shifts and you've also got social demands and you've also got family demands. And so, you know, it's not just a question of are you motivated for university - maybe, yeah - but you're also motivated for these other things that compete. I think that's where us having high expectations of students is really important. I think being cognisant and aware of what their worlds look like and making sure that these are all achievable tasks is really important. I also think we're all the same right - if you get asked whether you'd like to go for a run or eat chocolate bar, you often get the chocolate bar. It may not be the best choice and that may not be the end goal, but the motivation kind of in the moment often leads you to the easy option, rather than the more beneficial option.

**Agnes Bosanquet:** So that idea of self-efficacy is that something that that can change or is it a is it a fixed thing?

**Alissa Beath:** Oh definitely, yeah, definitely can change. It's quite a malleable construct. There's a lot of things that affect it, including students' prior experiences - so having mastered something in the past, that's going to increase my self-efficacy. Doing well on assessment tasks, feeling like I'm doing a good job of my learning, that's going to increase my self-efficacy.

**Agnes Bosanquet:** So there are things teachers can do to contribute to, what is it, positive self-efficacy or how would I call it ...

**Alissa Beath:** Higher self-efficacy.

**Agnes Bosanquet:** Higher self-efficacy. Okay, so what can teachers do that contributes to that?

**Alissa Beath:** Were you going to say something Penny or should I go? I think there's a lot of things we can do, I think. Making it clear to students that high self-efficacy is a useful thing but it's not the goal in and of itself. You need something beyond just having a feeling like you can be capable, that you can achieve the things. The reason that self-efficacy is beneficial to actual performance, or to doing well in a specific task, is that following the higher self-efficacy, students then put into place these more efficient ways of studying, these more active learning strategies. And that's really the key to why having a high self-efficacy is beneficial for them. It's not just a matter of believe in yourself, and you can do it - that is important - but the real thing is actually doing something in order to do this.

**Penny Van Bergen:** I think it's like believe in yourself and the conditions will be right for all of those other things to happen. I think things that teachers can do to sort of facilitate that as well - I think that messaging is really important. I think enabling mastery opportunities within classes and that might mean breaking down tasks into smaller chunks within tutorials, for example, so that you go 'yeah I can do this', and then you're opened up to the kind of the next steps.

There's a lot of literature around verbal persuasion and whether that you know that kind of encouragement, whether that supports self-efficacy and it's a little bit of a mixed bag. If you're told, 'yes, you can do it, go for it', but then the student falls down, they just learn not to trust you anymore. And so it's you know, look, we want positive messages about these are achievable tasks, but we want them with the strategies in place for here's how to be successful, here's what it's going to take within this unit, here's how to approach the assignment, so the hard cognitive work still has to come from the student. But all of the parameters are defined clearly enough that they feel comfortable with what's required, right.

I think sometimes in thinking about what decision making looks like for students, we maybe open up too much and say 'you decide all of the angles'. And there's lots of pitfalls, there's lots of spots where they can fall down ... There's a bit of a dance here between us defining parameters and allowing kind of cognitive growth and opportunity in the right spots.

**Agnes Bosanquet:** Sorry to interrupt, but I know a lot of people will understand the idea or will know about the idea of self-esteem. Is that different from self-efficacy?

**Penny Van Bergen:** Yeah, a little, they're related.

**Alissa Beath:** Yeah, they're related, self-efficacy is more specific and it's more about competence in a particular area, whereas self-esteem tends to be more generalised. I think of myself as a good person. I think of myself as being a valuable person or a being of worth, whereas self-efficacy when it's most useful to us is really specifically applied to a particular area of competence or a particular skill. I could have high self-efficacy about my ability to sit down and run some statistical analyses, but that could be really different to my self-efficacy

to getting up in front of a class and teaching a lecture. So self-efficacy is most useful to us when it's really specific and localised.

**Penny Van Bergen:** It's also about those beliefs, whereas self-esteem, because it's more globalised, that tends to be a bit more of a kind of general fuzzy emotional feeling about yourself as opposed to a specific cognitive belief.

**Agnes Bosanquet:** Okay, that makes sense. What did I interrupt you saying, Alissa, about self-efficacy?

**Alissa Beath:** I think it was going to be something to do with what we can do to help students' self-efficacy. I think that one of the challenges I think with teaching in higher education is that it is very much an independent environment for students to be independent learners. But we as educators, I think, need to find that nice balance between making it too independent - and therefore giving them more opportunities to fail because it's just too much for them to do so they get too lost - versus hand holding a bit too much and giving them not enough opportunity to develop their own skills and to grow themselves. I think that's a really tricky middle ground between those two extremes, but I think that's one of the things that we as an institution can strive towards having a better middle ground between those two. Things to really be able to optimise students' growth and development throughout their degree, but also providing them with opportunities so that they're set up to succeed. There's a lot of things we can do to help them do that.

**Agnes Bosanquet:** So one of the things that I think is on a lot of people's minds, especially like post lockdowns, is student mental health and wellbeing. I'm wondering your take on that.

**Penny Van Bergen:** I think this comes into play when we think about those different motivations that students might have, and we know that mental health challenges can impact both self-efficacy and motivation really strongly. I think mental health is an area where we know that there are hugely increased rates of mental health challenge at the moment. But it's also an area with expertise is really important, and kind of really high level expertise. I think maybe some of the measures that we put in place sometimes to accommodate mental health might be well meaning but not actually what's required in the situation. So somebody suffering having an extra two weeks may not help them, and it may make other students confused about, you know, what's the difference.

What we do want to be doing is referring students onto health services consistently when we need to. I think the institutional responses are really important, and I think that's where universities are doing a good job to be aware of these things. I'm not sure they would have been twenty years ago. I think at the institutional level as well, knowing what's actually helpful for students versus sometimes saying 'okay, look, just have extra time' which doesn't actually help because it's not addressing the root causes. Sometimes the extra time does help, you know, but I think looking to the experts for guidance on what's an appropriate accommodation for this specific situation and for this specific individual is really important. That requires resources, which is challenging.

**Alissa Beath:** And I think it also requires expertise in the individual area, and that's not saying that people who work at university are not experts, but you know if you think about psychology and you think about mental health, having people with expertise about what actually needs to be done to support a student in that particular situation, rather than doing what we think would be the best thing to help that student, because often that's not the same thing.

If you think about something like social anxiety, if somebody has social anxiety, or they're having issues with being in a social situation or being in a public situation in front of a class giving a presentation, there's a lot of evidence that says that avoiding that situation will actually make that situation worse, will make the issue worse. Whereas trying to push through it in a safe and supportive environment is actually the best thing for the person in that situation. And so, using evidence to know what is going to work and what's not going to work, particularly when you need to do things efficiently on a big scale like a university does, I think that's something that could be strengthened.

**Agnes Bosanquet:** So the key is the safe and supportive environment requires an expert ... It's not just the teacher who creates that?

**Alissa Beath:** Oh, no not necessarily ... If somebody is struggling with it then putting them up in front of a class of fifty students is going to be too much, there's definitely going to be a threshold there but doing a lower version of that task in front of a smaller group of people in front of a different audience could be something that encourages the students to develop those skills and lets them succeed in a safe and supportive environment that actually doesn't just avoid the situation and therefore might make the problems worse.

**Penny Van Bergen:** Yeah so I mean the reasonable adjustments need to be evidence based, right, and if that's left to individual convenors to determine, it's putting them in a really hard spot because they don't have that that clinical expertise.

**Agnes Bosanquet:** I'm very impressed with your eloquence just, you know, off the cuff so well done.

**Penny Van Bergen:** Thanks. It's hard. without slides.

**Agnes Bosanquet:** I mean it really is testing your ability to articulate that stuff about your discipline, I mean it's really fairly basic stuff that I think that you'd expect undergraduate students to be getting that and being able to explain it in some ways.

**Penny Van Bergen:** I would love undergraduates to get it, I don't know if they do, but I reckon a unit where they all got about their own learning, they would just benefit so much from it.

**Alissa Beath:** Yep.

**Penny Van Bergen:** I'm going to put that pitch in so if someone wants to hire me back to Macquarie, I'll develop it.

**Agnes Bosanquet:** Excellent.

**Alissa Beath:** I have plans of how to how to put that into psychology. It's been a long, long to do on my end to actually do something like that.

**Agnes Bosanquet:** I think that would help every single student.

**Alissa Beath:** Wouldn't it? A first year foundation unit across all courses.

**Penny Van Bergen:** Yeah, every time people talk about induction they talk about forms and processes, which is good and important, but if it was about, here's how your brain works and here's how you're going to be able to study most effectively, and here's how you're going to be able to help yourself, and now here's where it connects up to these supports.

**Agnes Bosanquet:** That sounds brilliant. So when we're on the Executive, that's what we're doing, right. All right, well, well done Thank you so much.

**Alissa Beath:** Can I can I add one more thing, Agnes? Sorry, something that could be like a little thing at the end, or at the start. I think while doing all this kind of stuff institutionally takes a lot of work, in terms of doing teaching in the right way and understanding students in the right way, it's the kind of thing that would pay off longer term, because it means that we're teaching more efficiently, it means that they're learning more efficiently. And the processes will then roll out so much more smoothly and more efficiently longer term, so it's a short term investment for a real long term success.