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# Understanding university teachers' approaches to design

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# Understanding University Teachers' Approaches to Design

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## Abstract

Although there has been significant research into approaches to teaching in higher education, comparatively little is known about university teachers' approaches to design. This paper presents preliminary findings from a study that is investigating the design processes of Australian university academics across disciplines in the Arts, the Sciences and the Professions. A summary of the design processes of two Australian university teachers in the Sciences is presented. The purpose of this paper is to provide a brief background to the study and discuss the preliminary insights gained from these two individuals.

## Introduction

The past decade has seen a significant expansion of distance, open and flexible learning as advancements in information and communication technologies have offered new opportunities for teachers and learners to interact without needing to be in the same place at the same time. With that expansion has come an increased awareness of the need for carefully planned and designed online learning experiences that are based on principles of effective pedagogy. A key difficulty, however, has been in supporting the design process and disseminating successful designs that can be adopted by others.

The 'learning design' approach seeks to systematically describe learning and teaching experiences, using textual and/or diagrammatic descriptions that represent key principles (e.g., Bennett, Agostinho & Lockyer, 2005; Goodyear, 2005). A significant area of learning design research is investigating means by which teachers can document and communicate their designs to support teaching practice, and how design can be shared, reviewed and adapted by others (e.g., Agostinho, Harper, Oliver, Wills & Hedberg, 2008; Britain, 2004; Conole, Littlejohn, Falconer & Jeffery, 2005; Falconer, Beetham, Oliver, Lockyer & Littlejohn, 2007). The range of current applications includes: the documentation and dissemination of 'best' practice examples for adaptation by others to support the design process; documentation and analysis of current practice to support re-design; integration into design support tools and planners for teachers and designers; and the development of international standards and specifications to support e-learning systems.

The success of any learning design approach to supporting teachers' design processes, however, is dependent on how well it can be integrated into teachers' current design practices. That is, without knowledge of how teachers design we have a limited understanding of the context into which a learning design approach will be integrated, making it difficult to anticipate the kinds of design supports a teacher might most effectively use. Research into university teachers' approaches to teaching (e.g. Ramsden, 2003; Prosser & Trigwell, 1997) is helpful in understanding the importance of teachers' design approaches. The body of literature on approaches to teaching in higher education has explored the different approaches university teachers adopt in different contexts, and identified ways to categorise these along a continuum from more 'teacher-focussed' to more 'student-focussed' approaches. A significant finding from this research is the chain of relations between a teacher's thinking, his or her teaching approach, the learning approach taken by students in response to the teaching approach, and student learning outcomes achieved (Trigwell, Prosser, & Waterhouse, 1999). Thus, it is reasonable to expect that supporting teachers' *design thinking* (which is part of teacher thinking in this set of relations) will have a flow-on effect on student learning outcomes.

In the past, there has been more of a focus on researching the practices of 'expert' instructional designers (e.g., Perez, Johnson & Emery, 1995) and on making prescriptions about educational design practices (Hoogveld, Paas, Jochems & van Merriënboer, 2002) than on understanding how university teachers go about design. In higher education, educational design has been thought of mainly in terms of the work of

trained instructional designers who support faculty-based teaching staff, with little attention paid to the routine design work undertaken by individual university teachers as part of their everyday work. These individual academic teachers, working alone or supported by a team of tutors, are responsible for the intellectual content and the pedagogical rigour with which it is taught, often without training in either teaching or in design. Goodyear (2005) speculates that the design process for an individual teacher consists of iterative cycles through pedagogical beliefs, knowledge and intentions, but concludes that little is actually known about teachers' design processes. Findings from Stark's surveys (2000) suggest that while there is a range of contextual factors that cause teachers to modify their intentions during the design phase, it is the assumptions that teachers have about their students and about what it means to teach in their discipline that are likely to be strongest influences on their designs. Although this work enables us to begin to explore teachers' planning, preparation and decision-making, there is much more that still needs to be investigated. For example, Stark concluded that her study did not explore the actual decisions teachers made when planning and designing instruction and argued that more research is required to better understand "the sequence in which the decisions are made" (p. 435).

This paper reports some preliminary findings from a study that is examining the design processes of teachers in higher education. A summary of the design processes of two university teachers, selected from a dataset consisting of semi-structured interviews with 32 Australian university academics across disciplines in the Arts, the Sciences and the Professions, is presented. The purpose of this paper is to provide a background to the study and demonstrate what might be learned from these interviews about how university teachers' design learning experiences.

## **Methodology**

The study uses a qualitative approach, appropriate to the exploratory nature of the inquiry. The investigation is guided by the over-arching research question: How do university teachers design learning experiences? Semi-structured interviews were conducted by telephone or in person with 32 university teachers. Participants were recruited through an email invitation distributed via the mailing lists of key Australian professional organisations and networks focused on university education. A sample of volunteers was chosen to ensure the participant group represented university teachers with a range of online and face-to-face teaching experience, across the three broad discipline groupings of the Arts, the Sciences and the Professions. These sampling choices were based on factors found to influence approaches to teaching (and therefore possibly design) identified from the related research literature.

The interviewers posed a series of questions asking participants about:

- the range of general processes and specific activities they typically engaged in when designing new units or redesigning existing units;
- the considerations and factors that influence their designs; and
- the sources of inspiration and support for their design processes or ideas.

All participants also completed an online survey that included the *Approaches to Teaching Inventory* (Trigwell, Prosser & Ginns, 2005).

The interviews were audio-recorded, transcribed verbatim and coded using an analysis framework which was derived from the research questions and themes emerging from the data. Each interview has been coded by two members of the research team to improve the reliability of the data analysis. The purpose of this paper is to demonstrate the insights that can be gained by focusing on design practices, thus two interviews has been selected from the larger data set to provide an in-depth account.

## Results

### *Participant 1: Harriet*

Harriet described herself as relatively new to university teaching with seven years of experience as a university lecturer, in both online and face-to-face modes. At the time of the interview she was employed at a university with an avowed commitment to face-to-face teaching and learning. Since taking up her position at the university, Harriet's course team had undertaken a comprehensive review and re-design of their degree program in psychology. She described the revised degree as more inter-disciplinary, while still maintaining a strong emphasis on scientific inquiry and knowledge.

Harriet described her approach to teaching as "critiquing and challenging" accepted methodologies and providing links between "social-cultural issues and physicality". In the interview, she emphasised the importance she placed on her students making links from theory to real world practice, and thinking critically rather than just learning 'facts'. Harriet also explained that she wanted her students to understand that psychological thinking was about looking for commonalities in human behaviour, but also identifying "a group or an individual for whom [white middle class Western] norms don't apply".

When asked about her institutional context, Harriet explained that the degree curriculum developed by the whole teaching staff provided a shared overall framework, within which individual academics exercised discretion over the design of their own units. There were broad institutional requirements about the number of assessment tasks and general assessment practices, but within those academics had "complete freedom" to assess in whatever way they wished. Harriet said key limiting factors were insufficient time for teaching design and a relatively limited technical infrastructure, which she felt had restricted the online activities she could include. So, for her, online technology had become a means of "materials management" so that she could update content between lectures. She used online discussion tools only to respond to student queries, mainly focusing on providing similar information to all students to reduce opportunities for misunderstandings.

For Harriet, the new degree structure and the arrival of new staff provided the impetus for major unit redesign. She described her process of designing a new unit within this context as, firstly determining how the unit would fit into the overall course, deciding what content to cover so that there was integration across units and progression and expansion from year to year, and then linking this with the assessment. Her stated aim was for the assessment to be part of a "learning trajectory" which would develop students' skills and understanding as they progressed and that it also be "fun" and "engaging". She saw online technology as having a place in her design only if it was appropriate to the specific learning activities the students were undertaking.

Harriet saw 'redesign' of an existing unit as a kind of "maintenance" process that could be conducted after the unit had been established. She again emphasised the need for first ensuring a good fit with the overall degree, then choosing resources and then developing the assessment items. Using a particular example of redesign, Harriet spoke about her intention to introduce online support for a collaborative assessment task that she planned to introduce into an existing subject. She provided this as an example of how she was hoping to extend her use of online technologies in the future.

Harriet described formal and informal student feedback as a key influence on her teaching:

I've come to this way of developing materials simply through trial and error. And failing to meet objectives for students, getting masses and masses and masses of feedback from students you know encouraging them to be brutally honest, tell me what went wrong, tell me how I could've fixed it.

Further important influences on her teaching came particularly from her colleagues, both at work and via an informal network she had developed. She also cited examples of inspirational teaching from popular culture and content that she “picked up” from everyday life. Harriet explained that although formal staff development had played an important part in her early career, she no longer found it useful. She preferred instead to rely on reading of the literature to identify new teaching ideas and placed a high value on peer review and support.

### *Participant 2: Colin*

Colin described himself as an experienced university teacher with over 25 years of experience, five of those involving online teaching. His area of disciplinary expertise was chemistry and at the time of the interview he worked at a multi-campus university. He was heavily involved in first year teaching, while also teaching some elective units in the later years of the Bachelors degree.

Colin explained that he wanted his students to learn how to “think like a chemist”, which to him meant learning “how to imagine the molecular world, [and] to explain observations” based on understanding scientific concepts. Colin stated a commitment to developing students’ writing and communication skills throughout their degree course, but did not expect students to be able to think critically in their first year. Instead he saw critical thinking as developing in later years, founded on a solid understanding of chemistry content. Colin saw his greatest teaching challenge as needing to cater for a diverse range of students entering first year chemistry, many of whom did not come to university with a strong background in science or mathematics.

Within Colin’s institutional context the need for courses to be consistent across campuses had led to the curriculum being seen as “set in stone” with limited options for tailoring units to the needs of particular student cohorts. He also explained that there were general university policies governing assessment, mainly to prevent over assessment. Like Harriet, Colin identified the limited time available for design and planning as a key challenge. He also believed that online learning involved “a whole different sequences of challenges and constraints but also potential as well”.

In describing his experience of designing a new unit Colin detailed the creation of a new second year unit developed to focus on current environmental issues. He described the process of design as beginning with a comparison of other Australian and overseas units, then moving to the selection of resources from professional organisations which were synthesised into a plan for the content. Next, he considered the assessment and the laboratory component, and finally decided on other supporting activities involving problem solving and discussion. For Colin, the overall design was based on what content could be covered in the time available, with attention given to “the level and depth” to ensure students would have sufficient content knowledge before conducting their own laboratory investigations. He describes the overall rationale as follows:

What we wanted was a significant project component of the unit, mainly to get students to pick something that they feel passionate about, you know, if they’re interested in, sort of, energy, if they’re interested in toxicity of chemicals or whatever, so we were very keen on ensuring that there would be a strong project component.

In describing an experience of ‘redesign’, Colin explained how recent changes within the university had meant a move away from a rigid curriculum across campuses such that he was now able to vary the content and assessment. Coupled with the arrival of a new staff member and the purchase of new software, this provided a reason to redesign the first year unit. He described this as an opportunity to “question everything that you do in the unit”. As a result he was taking a new approach to content. This approach was focussed less on coverage and more on depth, so that topics could be explored in greater detail and “real world issues” could be incorporated. This meant changing the structure and using online technologies to provide both remedial and extension materials to better cater for the diverse needs of students.

Colin cited his own desire to improve the quality of teaching and his theoretical model of how students learn as being major influences on his design practices. He described how these ideas had developed both from student evaluation feedback and from his own research on student learning in his discipline area. The practicalities of teaching large classes of diverse students and having to plan for different learning contexts within the timetable also affected his decisions. Like Harriet, Colin placed a high value on his own reading of the higher education research literature and on good examples from colleagues as his primary sources of new ideas. He said that although he recognised the useful role teaching development staff could play, he had not found them helpful because in his experience most of the staff did not have a good understanding of science teaching and most examples provided were more relevant to the humanities.

## Discussion

Care must be taken not to generalise from the two examples provided, but to focus instead on what the information provided reveals about these two individuals and their design practices. The responses provided in both cases reveal something of the interplay between teaching and design considerations. For example, both participants considered disciplinary thinking skills rather than content to be the basis of their teaching approaches, yet both placed selection of content ahead of other decisions when designing and redesigning. Further, in both cases online technologies were seen as means to deliver content – in Harriet’s case updated content between lectures, and in Colin’s case remedial or extension content for first year students. Although not having a ‘transmission of knowledge’ focus as such, both participants placed a high value on understanding content as a basis for further intellectual development, and this in turn was reflected in their approach to design.

Both participants also considered progression within the broader curriculum when making design decisions about their units. Colin’s two examples in particular highlight how one teacher can take different teaching approaches in different contexts. In the first year subject, Colin was not concerned about developing critical thinking as he considered this to be better placed in more advanced units. This illustrates how an ‘approach to teaching’ should be considered as a product of beliefs and behaviours that teachers adopt in response to a *particular* context, rather than being a characteristic intrinsic to an individual. This supports a conclusion drawn by Norton, Richardson, Hartley, Newstead and Mayes (2005) from their study of teachers’ intentions about teaching in higher education that “the same teacher might adopt an information-transmission approach when teaching first-year undergraduate students but a learning-facilitation approach when teaching postgraduate students” (p. 563).

In both cases the individual academic had a high level of autonomy in determining what occurred in their units, provided their designs were consistent with both the course curriculum and with the broad institutional rules for assessment. Further both recalled a range of opportunities for design and redesign within which they could make decisions based on, for these teachers, well-developed ideas about the characteristics of their students and about what their students needed to learn within the disciplinary context. Both were highly motivated to improve the quality of their teaching and relied on student feedback and collegial support, in addition to their own reading to develop their skills. Further, consistent with Goodyear’s (2005) conjecture, neither participant mentioned drawing on a specific set of examples available as a resource to support their design process, but both mentioned being informed by ideas and examples from others in their discipline.

The summary of two higher education teacher’s design practices presented in this paper demonstrates the richness of information that can be gleaned when teachers are asked how about their design processes. There is little investigation in this area and thus much of this design process is implicit. Interesting Colin concluded the interview by saying: “I’ve never really thought about all of this”. Full analysis of the 32 interviews is underway and will enable more comprehensive and specific findings to be developed from this research. Additionally, this investigation will be augmented in a further phase of our study during which the design processes of participants will be observed. This will provide an additional source of evidence with which the interview data can be triangulated and our findings extended.

## Conclusion

This paper has described a study that is investigating how university teachers' design practices. A summary of the design process from two Australian university teachers has been reported. One of the key underlying assumptions for the learning design conceptualisation is that reporting of pedagogically sound designs, in the various formats currently being explored, will support teachers in the design of effective learning experiences.

This study is seeking to build on the very limited research about teacher design processes to extend our understanding of how best to represent learning designs for teachers and how this representation might align with teachers' actual practices. The two examples provided allow some insights into this process for these teachers. The responses in both cases reveal something of the interplay between teaching and design considerations and it is anticipated that the full set of interviews, when analysed, will allow more general principles to be offered.

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To be added in final submission

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