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Negotiating pedagogical challenges in the shift from face-to-face to fully online learning: A case study of collaborative design solutions by learning designers and subject matter experts

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Introduction

Tertiary organisations need to decide how to respond to the 'Age of Disruption' (Christensen, et.al 2011); that is, the massive changes occurring across all sectors throughout the world due to advances in internet and digital technology. Students coming into universities are increasingly digitally native – that is, they have been exposed to digital technology from a very young age – and so are expecting their educational institutions to incorporate the latest technologies in their teaching and learning approaches and environments. Meanwhile universities are trying to determine how to respond to the digital age, competing with each other to provide high quality, fully flexible and innovative online offerings that allow them to stand out from their competitors, and meet often non-traditional and global audiences. This has created new demands for universities and their academic staff members, which different universities have attempted to resolve in various ways. This article will discuss some of the challenges university's face in responding to these issues, and examines a case study illustrating the way in which one research-focused university has chosen to respond to these new challenges.

Students within the Age of Disruption now expect flexible, personalised, innovative, and digitally interesting online offerings from universities (see Harden 2012). No longer is it sufficient for SMEs to utilise a transmissive approach, where the 'sage on the stage' (Schwerdt & Wuppermann 2011) orates their latest research in to a lecture. Students now have the world at their fingertips via the internet, and so do not rely upon expert oration presented at a particular time and place (Puzziferro & Shelton 2008). Instead they can access various expert voices from across the globe at any time and any place, whether that be at 1am at home in their pyjamas, or at 6am in a remote village in Indonesia. This creates challenges (see Laurillard 2002) for subject-matter-experts (SMEs) as they need to learn new ways of thinking about and designing their subjects, as well as becoming tech savvy, or having access to someone who is. Moreover, for reasons that will become more evident below, developing good quality online subjects requires a different set of pedagogical skills to those required for developing traditional face to face subjects."

As SMEs are accustomed to developing learning materials for a lecture-based "transmissive" style of teaching, they have tended to use the learning management system (LMS) as an online repository for readings and information about assessments (Walmsley 2015). Traditional subject designs, which typically follow a similar structure from week to week, focusing on identifying weekly topics for lectures and tutorials, have tended to be "copied and pasted" to the online environment. By contrast, given the lack of face-to-face engagement, and weekly class times to motivate students and set their learning pace, online subjects need to be designed and developed differently to face-to-face subjects.

It can be challenging to create a sense of social presence so that the online student feels a part of the learning community. It can also be difficult to assess the level of student learning and to regularly communicate with students without being face-to-face. Online students may require constant feedback and clarifications on difficult concepts which can be time consuming for the SMEs (see Esani 2010). These challenges can be overcome by specifically developing online subjects for the online environment using suitable pedagogical and technological approaches (see Li & Irby 2008; Visser 2000).

On the other hand, digital learning can permit different elements and priorities, such as personalisation, self-directed learning, and co-creation of content. High quality and engaging online subjects can emulate the kinds of collaboration, discussion, interaction, and co-construction of meaning and knowledge that can occur during some face-to face-learning, such as tutorials and

laboratories. A major challenge for SMEs accustomed to developing and teaching face-to-face subjects is to design learning using a constructivist approach. Successful online subject development is dependent upon the commitment (Magnussen 2008), enthusiasm, interest and skills of dedicated faculty (Winkler-Prins et al. 2007).

Embracing these challenges may lead to a redefining of the professional identity of SMEs. The nature of teaching, roles and workload distribution changes as SMEs teach in fully online subjects (Coppola, Hiltz & Rotter 2002; Young 2002). Many experienced or expert face-to-face teachers find themselves as novices or beginners when first teaching online. This can cause resistance towards developing and teaching online (McQuiggan 2007); moreover, when not designed properly, online subjects may be seen as the poorer cousin and may be regarded as less prestigious (Redmond 2011). Hence, universities need to establish ways to support SMEs, who are traditionally more research-focused than teaching-focused, to develop good quality online subjects (see Appana 2008; Dykman & Davis 2008).

Norris et al. (2013) argue further that each institution needs to "reposition itself to play its part in national success in the Age of Disruption…Institutions need to redirect and reinvent existing visions, processes, and practices as part of strategic campaigns of planning, execution and organizational development. And …find ways to continuously resource, refine and rescale innovations in the face of scarce resources." The key challenge of contemporary universities is how to transform traditional infrastructures to achieve these goals. Further discussion of how the University of Melbourne aims to transform its current infrastructure to achieve this is discussed in more detail below, followed by a case study examining how this has been achieved.

Solutions to resource the development of high-quality online subjects

To achieve these goals online can require technical knowledge that many SMEs do not have. Moreover, many SMEs lack the pedagogical knowledge or expertise to know how best to design subjects specifically for online delivery. Hence, different universities have established different ways to provide this expertise in order to allow high quality online subject development with their SMEs. Mishra & Koehler's (2009) Technological Pedagogical Content Knowledge (TPACK) framework is a useful way of capturing the capabilities required for developing online subjects.

The TPACK framework attempts to identify the nature of knowledge required for technology integration in delivering online subjects while addressing the complex, multifaceted and situated nature of SME knowledge. The TPACK framework describes the capabilities required for effective teaching with technology with seven constructs: Content Knowledge, Pedagogical Knowledge, Technological Knowledge, Technological Content Knowledge, Technological Pedagogical Knowledge, and Technological Pedagogical Content Knowledge (see Figure 1).

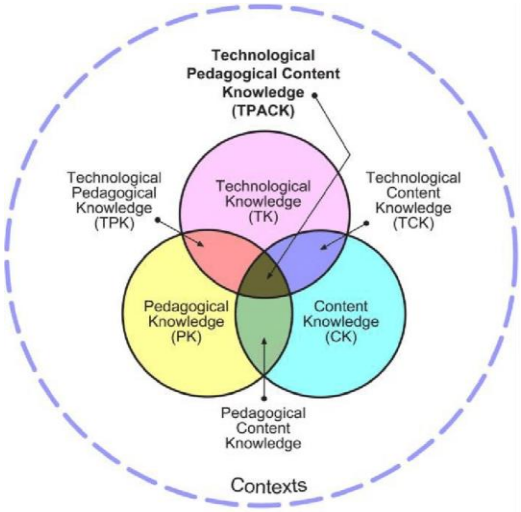

Figure 1: *The Technological Pedagogical Content Knowledge (TPACK) framework (Mishra & Koehler, 2009)*

Figure 1 shows that the basic technological, pedagogical and content knowledge aspects of the framework overlap. Pedagogical and content knowledge overlap to produce pedagogical content knowledge (PCK), which is knowledge of pedagogy that is applicable to the teaching of specific content, such as using an experiential model of learning for a research subject, or a model of learning that focuses on first learning basic concepts, then integrating and applying these for clinical subjects. Pedagogical and technological knowledge overlap to produce technological pedagogical knowledge (TPK) which is knowledge of how teaching and learning can change when particular technologies are used in particular ways, such as using video to *show* the application of a particular psychotherapeutic technique, rather than just attempting to describe it. Technological and content knowledge overlap to produce technological content knowledge (TCK) which is knowledge of the manner in which technology and content influence and constrain one another, such as the kinds of constraints that are encountered when trying to convert face-to-face software tutorials to online tutorials using domain-specific software. Finally, all three overlap to produce TPACK, which is the basis of effective teaching with technology, and understanding of the interactions among content, pedagogy, and technology knowledge.

The way in which different universities have chosen to respond to the challenge of utilising and applying knowledge in all of these areas when developing online subjects varies. Future research will surely examine and compare these different approaches, in order to gain some understanding of the various pros and cons of each approach.

Some universities may choose to upskill their SMEs, attempting to teach them how to develop good quality online subjects, and providing them resources and templates to help them with this (Goodyear & Carvalho 2013). They may then attempt to train SMEs to become adept at using the functions inherent within the institution's LMS. In this way, SMEs are supported to take on all roles in the TPACK framework: the technical, pedagogical, and content knowledge roles, and all roles where these intersect (as seen in the TPACK framework image), with pedagogical support from templates, and technological support provided within the LMS. However, this is a challenging proposal, as SMEs are already overworked, and so developing the skills to design, develop, review and maintain good quality online subjects, and providing them the time to do so, is stretching an

already overworked workforce, and detracts from their ability to focus on research. Moreover, taking on these roles may leave little time and resources left to truly innovate – especially given that technology is constantly changing – so it is difficult to expect SMEs to keep up with this. Finally, this approach may not lead to the highest quality online subjects.

That said, it does have the benefit of developing skills in-house that will most definitely be useful in future. All parts of the TPACK framework above (e.g. PCK, TPK and TCK) can be developed within the one SME, rather than being divided across different staff members with differing expertise; this may allow SMEs to become highly skilled at designing, developing and delivering online subjects, a skill set which will very likely be useful in the future.

Other universities are outsourcing their online subject development to so-called "white-collar" providers (e.g. Swinburne University has outsourced much of their online subject design, development and delivery to Swinburne Online which is owned by Online Education Services). In this option, the SME provides the content knowledge, while the white-collar organisation provides the rest of the resources, services and expertise by employing "third-space professionals", such as learning designers, who provide the pedagogical knowledge, and educational technologists, who provide the technological knowledge. "The greatest potential advantage of involving third-space professionals is they not only offer support for rather simplistic learning designs (sequenced learning content), but also for pedagogical approaches that put the learning and teaching process in the centre, rather than the learning content." (Koper & Oliver 2007 p. 16). However, providing such expertise across separate institutions may make it difficult to develop and provide expertise where the roles overlap in the TPACK model, as these roles tend be separated; for example, it may be difficult to develop knowledge of the manner in which technology and content influence and constrain one another (TCK), as the SME and educational technologists developing this content for the online format work in separate institutions. Outsourcing in this way also means that in-house skills are not developed within the university, despite these being essential skills for the future, that are most likely here to stay. There may be other criticisms as well, such as the university or SME staff having less control over how and what is developed and receiving less of the funds from the online students, or paying more of them out in expenses to the white-collar organisation.

Another alternative is to develop a department within the university comprising third-space professionals who then assist SMEs to design and develop their online subjects. Technological support is provided by educational technologists, graphic designers, and video production, for example, while pedagogical support is provided by learning designers who work with SMEs to provide the content knowledge. This may suffer from much of the same criticism as the approach just discussed, except it may be easier for the SMEs to work closely with the technological and pedagogical staff as they are within the same institution. In addition, the skills and infrastructure required to develop good quality online subjects are developed "in-house" and there are opportunities for third-space professionals to upskill and impart their knowledge and skills to the SMEs, which may be less likely when outsourcing (as in the previous option), as the outsourced companies presumably want to protect these skills, as that is what they are selling. Moreover, the university will have more control of the resulting subject design, and the processes behind it, as this is all occurring within the institution. A further benefit may be that the university does not need to share the income from their online subjects with an external institution.

The University of Melbourne has chosen this latter option, developing the Melbourne School of Professional and Continuing Education (MSPACE). This is discussed in more detail below. The focus of the article is to discuss the development of one particular subject, explaining how the above

processes were applied to develop a high-quality online subject, with technological and pedagogical support from MSPACE.

When establishing MSPACE, which was first developed as Graduate Online – Melbourne (GO-Melb), effort was expended to determine a basic subject development framework, described below. Research was consulted to determine evidence-based best practice within this field (for example, see Martin et al. 2017; Skiba 2017) and to "develop fluency with teaching and learning with technology, not just with technology, itself" (Jacobsen, et al. 2002, p. 44). Overall a major focus of this approach was to utilise design thinking, and to prioritise pedagogy over technology. Hence, the SME and MSPACE learning designer first designs the subject from a pedagogical perspective, and then they meet with the MSPACE team to determine how to build the subject from a technological perspective. This is discussed in further detail below.

UoM's approach to resourcing online subject development

When developing processes to design fully online subjects within MSPACE, a design thinking approach was utilised. Design thinking has been proposed as a way of resolving pedagogical and logistical challenges that university teachers encounter for which a solution is not immediately evident (Goodyear 2015). Goodyear argues that teachers need more "evidence-informed, creative, design-based strategies" to overcome such challenges. If design thinking is made more explicit to university teachers and they are better equipped with design skills, then they will be better prepared to systematically develop educational solutions.

Design thinking, however, can be quite a foreign notion to university teachers outside the design-based disciplines of engineering or architecture, for example. Indeed, this way of thinking may require a fundamental change in their own disciplinary way of thinking and being (Elliott & Lodge 2017). "Third space" professionals such as learning designers (LDs), instructional designers or curriculum consultants, can play a key role in bridging the gap in relation to design thinking. These professionals work collaboratively with university teachers to design and develop online units, often coming up with unique solutions to pedagogical challenges that neither party would be able to achieve working in isolation. There may also be a degree of professional development involved in this process as university teachers become more familiar with, and apt at applying, the principles of design thinking.

The case study described in this article examines the collaborative design processes utilised by MSPACE and SMEs as they negotiate a number of pedagogical challenges that arise during the conversion of a pre-existing face-to-face subject to a fully online format. As noted above, MSPACE is responsible for the design and development of fully online posgraduate courses. So far the MSPACE team has developed between 250 and 300 individual subjects across 20 programs utilising collaboration between MSPACE, including LDs and SMEs. The focus of the case study is on the design and development of *Psychodynamic Therapy in Psychiatry* (PTP), a six-week elective subject in the Master of Psychiatry program. The article is based on the reflections of some of the authors who were directly involved in the design and development of PTP.

The rest of this article describes the systematic team-based design process utilised by MSPACE to engage SMEs in the creation of online subjects. The article specifically focusses on the subject design stage of this process. What follows is a critical examination of the way in which the team attempts to develop high-quality online subjects using a design thinking approach, and a graphic design for learning in particular, with a focus on one particular subject. In particular we highlight how various strategies were made possible due to the team-based approach to the subject's

development, and we critically reflect on this approach, including lessons learnt. The collaborative work between SMEs and MSPACE throughout the entire learning design process is shown in Figure 2, which depicts six interconnected stages of development.

Figure 2: *LD and SME process map*

Stage 1 - SME Induction: Once a program has been approved for development as a wholly online course, the SME Induction stage commences with a "kick-off" meeting. In this phase, SMEs are inducted into the ways of working with the MSPACE team in order to gain an understanding of what is required to develop and launch an online subject. This provides an opportunity for the Learning Designers (LD) to highlight their role and explain what support they are going to provide to the SME, for the LD and SME to negotiate how they want to work together to contribute to the learning design process, and to review the handbook entry if this already exists (it usually does). It is crucial that the LD and SME agree on intended learning outcomes and the overall subject development process before the next stage starts, as the handbook is usually already determined and often only minor changes to intended learning outcomes are possible at least for the immediate future. In sum, the outputs of the first stage provide a foundation for the development of the subject design (Stage 2, see below).

Stage 2 - Subject Design: In this stage, the LD consults with the SME to review the existing subject (in this case the face-to-face version of PTP) in order to gain a better understanding of its underlying design, and to determine the assessments (while assessments may already be listed in the handbook, often these are suitably vague to allow the LD to help the SME determine what they will actually be). A backward design approach is typically used (Wiggins & McTighe 2006), which attempts to first align the assessment tasks with the intended learning outcomes, and only then determine the content that should be included in the subject.

The SME and LD then work together to produce a design pattern that reflects the macro educational design of the subject (see Figure 3). The purpose of the macro design is to delineate a configuration of learning tasks through which students must progress, as well as the SME and learning designer's perception of how the subject is organised and the types of educational models the subject structure

draws on. It aims to clearly set out the educational philosophy, pedagogical approaches, strategies and tactics underpinning the subject (Goodyear 2005), the critical topics and concepts to be covered, the learning tasks to scaffold the skills required to achieve the intended learning outcomes, and the type of technologies that might be used to support tasks and assessments. It provides a "bird's eye perspective" of the educational structure describing the major educational components of the subject (e.g. modules, case studies, readings, discussion board, simulations, assessments, interactive tasks, videos, etc.). It also indicates the timing and sequencing of these components, such as how and when students are able to access and use them. The macro design provides an essential foundation for all the other stages of the learning design process and is crucial since it represents the SME and LD's shared vision for the subject development.

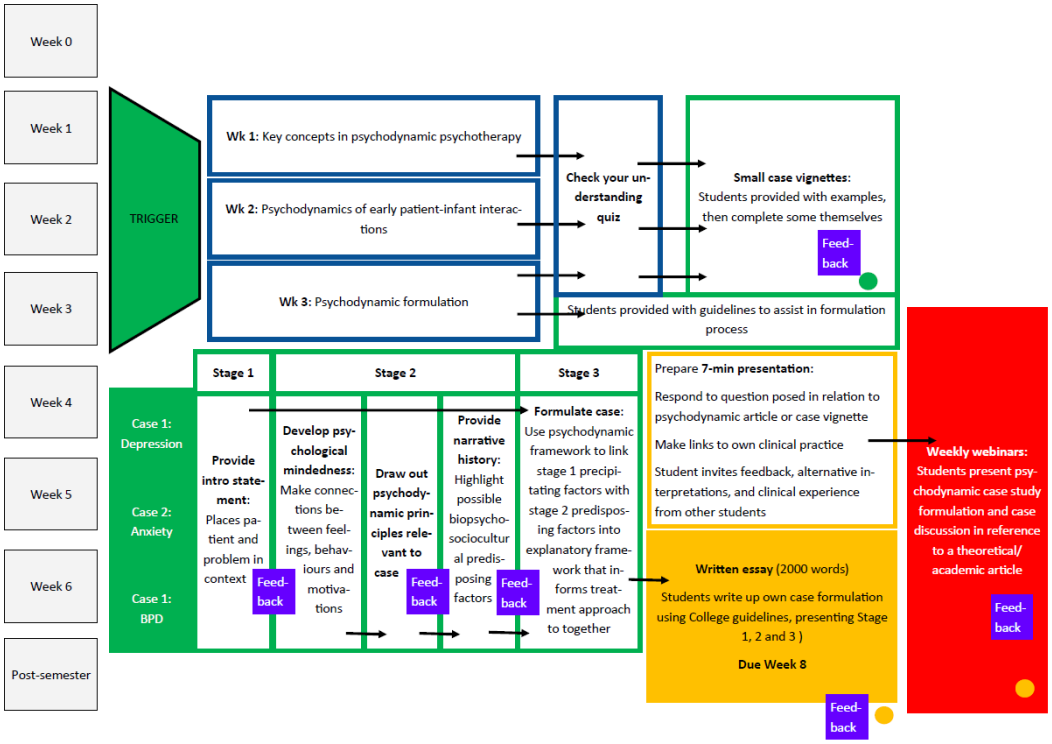

Figure 3: *A design pattern reflecting the macro educational design of psychodynamic therapy in psychiatry*

A key feature of the MSPACE program is that the initial macro design is then presented and reviewed by all of the LDs in the MSPACE team (around ten LDs); as far as the authors are aware, no other institutions undergo such a thorough peer-review process in regards to their subject design. Any suggestions for revision may be incorporated into the final version of the macro, as negotiated with the SME. This model is inspired by the notion of medical rounds in hospitals where junior doctors visit patients with more senior doctors to undergo bedside discussion and learning. This allows the expertise of several staff members to be shared in order to improve patient management. This is particularly useful within learning design, as learning designers often come from quite different backgrounds, with different approaches and different skill sets, and have developed various and diverse subjects, as well as being exposed to different technologies. Hence, hearing the feedback, suggestions and solutions of various learning designers ensures that various solutions have been considered. Moreover, this step ensures that all learning designers are satisfied that the subject design meets best quality standards, such as engaging and inspiring students; offering flexibility, choice and personalisation; ensuring cognitive, teaching and social presence; and focusing on self-directed inquiry and learning rather than transmissive teaching. Any suggestions for edits are brought back to the SME for negotiation and review. After the final version of the macro is approved by the SME, content scoping (Stage 3) begins. However, content scoping will not commence until agreement is reached on the development deadlines described in the subject development schedule, and negotiated with the project manager (PM).

Stage 3 - Content Scoping and Solutions: In this stage, the SME and LD meet with the MSPACE team to begin determining technological solutions to intended learning tasks. This allows the team to work with the SME to discuss the TCK and TPK intersections of the TPACK framework. If the macro appears to be beyond the scope of the production team in some way (due to time and resourcing constraints), necessary adjustments are made to the macro. For example, a macro design may initially have suggested a branching case study each week, but if the SME or the educational technologist is unable to provide one a week due to time constraints, this may be adjusted to one or two that are carefully designed to be used across several weeks of the subject.

In addition, the SME and LD will break down the macro structure of the subject into more finely grained weekly lesson plans or "meso" documents. The scope documents that are created include detailed descriptions of weekly (or per module) learning tasks and assessments. They also identify critical resourcing, educational media, and technology requirements. Bennett and Agostino's (2017) model of considering learning tasks, learning supports and learning resources for each part of the meso was used to develop the meso template for PTP.

Stage 4 - Prototyping/Proof of Concept: During a production scoping meeting all stakeholders involved in the development of the subject (the SME, LD, PM and the production team) sign off on the scope document, which then provides a foundation for the prototyping stage (stage 4). One week of content is built as a prototype for the MSPACE staff to test, in order to ensure that the SME and MSPACE team are satisfied with the style, interactivity and user experience of the content (note, details about developing the actual content for MSPACE to build are discussed below in Stage 5, as this is when most of this material is developed). If they are satisfied, the scope document is used as a template to move forward through iterative rounds of content provision, script review, build of components, build review, and final quality assurance sign-off.[1] If not, the content is reviewed until the team are sufficiently satisfied with the build to move forward.

[1] PM goes through this schedule carefully with SME, accounting for expected absences (conference leave, teaching commitments, etc.) to ensure it is feasible.

Stage 5 - Subject Development: Once the overarching design of the subject has been determined it is time to think more specifically about how students will engage with the subject in a meaningful manner on a module-to-module or week-to-week basis. This is at the core of the fifth *Subject Development* stage. Subject development entails a carefully crafted combination of student learning and assessment activities, with discipline-based content and technology-based tools: the draft of each week's or module's learning resources, supports and activities that will act as the blueprint for the actual content in the LMS has been referred to as a "micro". As Kennedy (2014, p. 8) states "there is no rulebook with micro education design, it's up to the SME and LD to chunk the subject into pedagogically and technically sound logical segments".

The micro document details the weekly components of the subject, the production load (the time needed to build the component in the LMS) and the student load (the expected time a student will spend on a task to complete it), as well as the appropriate use of different components of the subject. The template with weekly content will then go back and forth between SME and LD until the content is finalised and ready to be built in the Learning Management System (LMS). At this point it should include full references, videos, and images, which have been checked for copyright compliance.

Stage 6 – Final QA and Launch: The SME and MSPACE team progressively undertake a quality assurance process to ensure all aspects of the subject meet publishable standards, editorially, in terms of copyright, and in terms of user experience, before the subject is released to students. Once the SME is content that the subject has reached publishable quality, the subject is "signed off" by the SME as ready and is released to students.

Stage 7 – Subject renewal: The renewal period is denoted as the three-to-six-month period prior to the subject teaching term. In this stage, feedback collected from students during launch is reviewed to determine any changes that might be made before the next launch. Throughout launch, students will provide informal feedback (for example on the discussion forums); moreover, MSPACE collects some brief feedback after each video. As well as examining video analytics, feedback is collected at the bottom of each week (or module) of content, and formal feedback is collected from a university-wide survey. Finally, learning analytics can provide some information about student behaviour, such as attrition, log in frequency, hours spent in the subject, and so on. Such information is examined in order to improve the subject before the next launch.

Cochrane & Munn (2016) argue that design thinking is a process that cycles through (1) empathising and observing, (2) defining the problem, (3) creating ideas, (4) prototyping and (5) testing. The SME induction and subject design stages (stage 1 and 2) may be regarded as covering step 1, 2 and 3 of Cochrane and Munn's model, as the LD and SME begin by learning about each other's roles and what each wants to achieve in Stage 1 and 2, as well as defining the subject design problem in each of these stages and creating ideas. The initial macro developed in Stage 2 may be regarded as the first subject prototype (step 3 of Cochrane and Munn's cycle), which may be amended in later stages, for example, as technological solutions are derived to meet the intended learning design. Stage 3 involves more ideas as MSPACE attempts to determine how to enact the intended learning design using available technology, or bespoke technology that MSPACE is resourced to build. Then further prototyping of an actual week (or module, or whichever term suits the type of content) occurs in Stage 4 when one week of content is developed to see if the technological solutions trialled are appropriate; if not, these will be adjusted. The subject is not actually tested (step 5 of Cochrane & Munn's process) until it is launched to students in Stage 6 and then the feedback reviewed for renewal (Stage 7). The renewal process involves a limited redesign and development of the subject, so may be where an actual "cycle" is seen.

Another way to conceptualise the stages of subject development is to utilise Hernandez-Leo et al.'s (2014) design workflow, which identifies three stages of the design: conceptualisation, authoring and implementation. Conceptualisation can be regarded as the macro subject design (Stage 1 to 3 in the MSPACE design and development approach described above). Authoring can be regarded as the micro design (Stage 4 and 5 in MSPACE's approach), where content is written by the SMEs with learning design guidance, as well as the actual build of the subject within the LMS. Implementation can be regarded as the build of the subject in the LMS and completion of the learning tasks by the students (the remaining stages in MSPACE's approach).

The remainder of this article will examine the design and development of a particular subject within MSPACE, as articulated in the original macro. While several authors have discussed the use of macros theoretically (e.g. Goodyear & Ellis 2008), and some authors have examined the use of macros in various settings, there appears to be little in the literature examining the use of macros specifically for developing fully online tertiary subjects. Grincewicz (2016) describes using interactive whiteboards to help SMEs and instructional designers visualise their design. Wardak (2015) discussed the use of macros to design an educational blog and an educational game while Martinez-Maldonado et al. (2017) examined the use of a macro to create a Masters-level assignment and the use of macros by postgraduate students to develop a learning resource for environmental education in schools, but none of these examined the use of a macro for developing whole online tertiary subjects. However, as far as we aware there is little empirical research examining the use of a graphic macro design to assist with the development of a fully online tertiary subject. This article showcases an example of this.

The final design of the online version of PTP is described below, followed by a discussion of how this design overcame the issues identified when converting the subject to the online mode.

Designing the online version of PTP

The overall macro design for PTP is shown in Figure 3, but particular elements will be discussed in more detail throughout this section. After completing Stage 1 in the design process, a backwards design process (Wiggins & McTighe 2006) was used to create the macro (Stage 2), which focused first on the intended learning outcomes and how they would be assessed, followed by a consideration of the content and learning tasks that would scaffold students towards successful completion of the assessments, thereby meeting the intended learning outcomes. The macro was presented to learning design peers and some adjustments were made to the design; for example, adding the use of triggers at the start of the first few weeks to link to prior learning and activate cognitive presence, as discussed further below.

The macro was then presented to the rest of the MSPACE team to determine how to provide technological solutions to some pedagogical problems. Such solutions are discussed in more detail when describing the subject design in further detail below. Stages 4 to 6 were also implemented, which allowed a high quality final subject. No further details of these are discussed as this article is focused on the design and development of the subject.

There are various pedagogical models that could be used to try to understand the different approaches utilised when designing PTP. A couple will be described here, and then their application discussed further below. Walmsley's (2015) model that focuses on increasing student autonomy was utilised when developing the subject. Walmsley's model (outlined further below) incorporates Stephenson and Coomey's (2001) notion of two dimensions along which learning activities can be described (see Figure 4). First, they can be regarded as open or closed, where closed activities are

right or wrong answers, and open activities are open-ended questions. Second, learning activities can be regarded as tutor-managed or student-managed: the former are more guided activities where students have less control and autonomy, whereas the latter are more inquiry-based activities where students have more control and autonomy, leading to greater mastery.

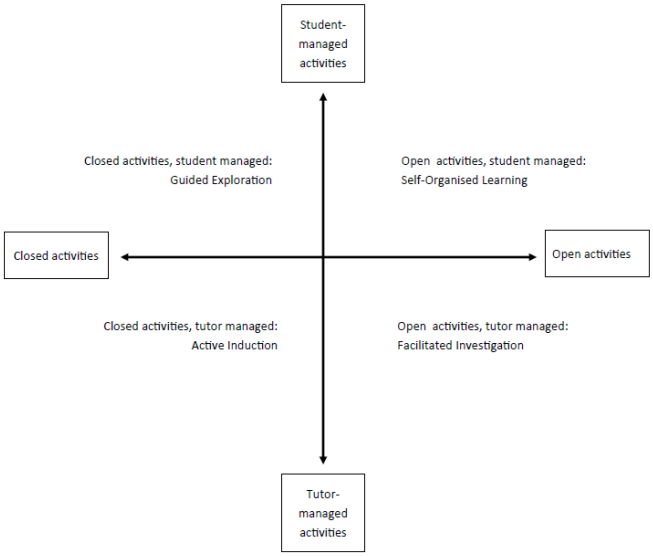

Figure 4: *Four types of learning activity (Walmsley 2015 adapted from Stephenson & Coomey 2001)*

Walmsley (2015) combined activities that vary along these two dimensions into four phases of scaffolded learning that aim to lead students to autonomy:

- active induction (e.g. students post responses to tutor-set questions in forum),
- guided exploration (e.g. students read peer responses and comments/suggestions),
- facilitated investigation (e.g. students challenge and build on another's ideas), and
- self-organised learner (e.g. students summarise and reflect on discussion/student's thread discussion and create new resource to share).

The first few weeks of PTP aimed to achieve both active induction and then guided exploration, the last few aimed to achieve facilitated exploration, and the major assessment aimed to ensure students became self-organised learners, after completing the weekly tasks that scaffolded the learning required to achieve this. This approach is particularly important when developing PTP as an online subject as many psychodynamic concepts are complicated and learners often feel intimidated when attempting to apply them to clinical scenarios; hence, the concepts need to be carefully scaffolded, learners need to be provided ample opportunity to practice applying and integrating the concepts learnt, and learners need to be provided ample support from the SMEs and from each other. How this was achieved in PTP by utilising Walmsley's (2015) pedagogical approaches will become evident when the subject design is discussed further below.

Before describing the study design, a second pedagogical model that was also utilised when designing PTP is the Community of Inquiry (CoI) framework developed by Garrison, Anderson and Archer (2000). This provides a starting point for the consideration of key elements required to create

a worthwhile educational experience in the online space. The CoI draws attention to: cognitive presence – "the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse"; teaching presence – "the design, facilitation and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes"; and social presence – "the ability of participants to identify with the community, communicate purposefully in a trusting environment, and develop inter-personal relationships by way of projecting their individual personalities (p. 90)".

Each "presence" plays a critical role in the quality and success of online subjects. Cognitive presence is reflected in the learning and teaching process, which may involve a triggering event that identifies an issue for inquiry, individual and collaborative exploration of the issue through which meaning is constructed, and the application of newly gained knowledge to workplace contexts (Garrison, Cleveland-Innes & Fung 2010). Teaching presence is reflected in the design choices made by the teacher in relation to the curriculum, learning tasks and assessments. It also involves teacher facilitation and management of purposeful online collaboration in order for students to achieve the desired learning outcomes. Social presence aims to provide a shared social identity amongst the community of online learners, and is considered a mediating factor between cognitive and teaching presence. The application of these models to the subject design is discussed below.

In Week 1 and 2 students were inducted to the fundamental concepts relevant to psychodynamic theory and practice, such as the different types of defences, transference and countertransference, and the psychodynamics of early development, including attachment theory. Each week began with a trigger that attempted to elicit links to students' prior learning and actively induct students to the learning process in the subject. The trigger included a clinical vignette with basic questions that aimed to draw out a number of Freudian concepts that students had previously learnt, thereby activating cognitive presence and links to prior learning. Students were able to share their responses on the page in the LMS as well as view expert responses afterwards. This design was only possible due to the contribution of the educational technologist and the guidance of the learning designer. Without the educational technologist to design tasks that could be conducted on the page, students would be sent out of the learning page on to the discussion board to respond to these questions, thereby interrupting the flow of learning. Moreover, the learning designer was able to share student feedback from other psychiatry subjects that students prefer one discussion board task per week; as discussion allows students to reflect at length on what they have learnt, the preference is to reserve discussion board tasks for the end of the week rather than utilising them as cognitive triggers and links to prior learning at the beginning. Hence, the educational technologist was able to provide alternative solutions (having students answer questions on the page in a task built by MSPACE) that allowed the pedagogical intent to remain intact.

As students learnt about each basic psychodynamic defence, they were exposed to a brief clinical vignette and asked to identify from a list the main defences being utilised in the vignette. The clinical vignette shown required students to view a clip from the movie *Ordinary People* (in which an adolescent receives psychodynamic therapy) (Redford 2014) and to consider which neurotic defences apply to the scene. These clinical vignettes represent student-content interaction with expert feedback from the SME. Students were asked some "tutor-led, closed questions", to use Stephenson and Coomey's (2001) terminology, which acts as the first step in their active induction to learning in the subject (Walsmley 2015). These also aim to begin developing psychological mindedness (Mace & Binyon 2005), which in itself begins the process of social induction (Garrison, Anderson & Archer 2000) to the psychodynamic discipline.

Towards the end of Week 1 and 2 students were provided with some more elaborate but still brief clinical vignettes for a couple of reasons. First, this allowed students to attempt to begin applying the concepts they had learned to some small "bite-size" learning activities, which allowed the learning tasks to be tutor-led but more open (Stephenson & Coomey 2001). Second, they responded to these questions together on the discussion board, so as well as developing cognitive and social presence, they moved to the next of Walmsley's four phases: guided induction.

In Week 3 of PTP, learners were provided with a useful framework, termed "Malan's triangles" (1976) to begin applying psychodynamic concepts to clinical cases. As Week 3 is more complex, the design will be described, and then the relevance of various learning principles to the week will be discussed. This framework incorporates two different "triangles" covering two themes, each with three different perspectives to consider, as follows:

1. The triangle of conflict, which encompasses:
    a. defences
    b. anxiety
    c. hidden feelings or impulses

2. The triangle of insight, which encompasses:
    a. current or recent past relationships/situations (not parents or siblings)
    b. distant past relationships/situations (usually parents)
    c. transference to the therapist.

An example of the interactive triangles is shown in Figure 5.

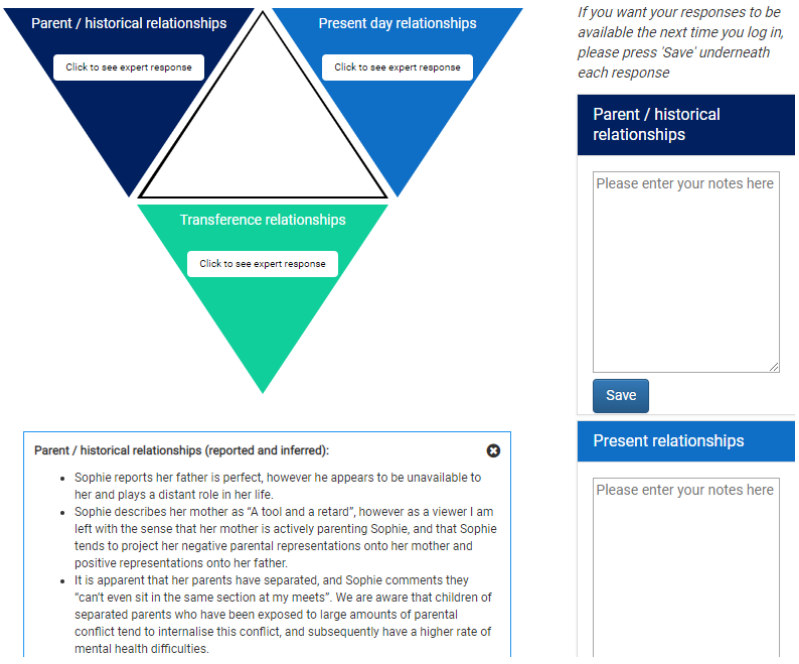

Figure 5. *Malan's triangles: an example of a large learning interactive that scaffolds the learning of key psychodynamic skills*

Each perspective (or corner of the triangle) was accompanied by questions to guide learners to elicit key themes and issues relevant to the clinical scenario; hence, these acted as "tutor-led open" questions, thereby moving into Walmsley's (2015) guided exploration. Students needed to invoke the fundamental concepts they learned in Weeks 1 and 2 in order to consider each perspective of each triangle. As students had already practiced applying individual psychodynamic principles to small clinical vignettes (in Week 3) learners were required to apply Malan's triangles to parts of a more complex 30-minute audiovisual clinical scenario.

Once students submitted their answers to questions relevant to each corner of the triangle, they were able to view an expert response to each perspective of each triangle relevant to the 30-minute clinical scenario. These experts answers will built into the learning task, so they were available on the page within the learning materials in the LMS; hence, the answers are available both contextually and at the point of need. Learners were invited to compare their responses to the expert's answers in order to identify anything they missed, and ensure they are extracting the main psychodynamic themes from the case for use in their psychodynamic formulation. Learners are then encouraged to discuss their comparisons on the discussion board with the tutor and with each other. The ability to build these complex interactives required that the SME work closely with the learning designer and educational technologist. Each team was also assigned a project manager to ensure the subject build was resourced and scheduled appropriately, and to establish alternative solutions should any issues be encountered.

Learners then categorise relevant aspects from each part of each triangle into "history", "present-day experiences" (relationships and dreams) and the "clinical encounter" (affect, non-verbal behaviour, transference and countertransference). This in turn prepares the information to be worked in to a psychodynamic formulation which typically encompasses risk and protective factors (derived from the history), and precipitating and perpetuating factors, derived from the present-day experiences. Observations under the "clinical encounter" allow additional information when considering these other factors, as psychodynamic formulation is interested in the unsaid, non-verbal, and subconscious processes that contribute to psychological expression and issues.

Students attempt a very brief formulation of the audio-visual case study presented in Week 3, and then compare their attempt to that conducted by the SME. Students post their formulations to the discussion board in order to be able to read each other's work and to make active comparisons of each other's formulations, thereby learning from each other's approaches.

Hence, Week 3 encourages students to start thinking in a more complex way about psychodynamic cases; i.e. to continue to become psychologically minded (Mace & Binyon 2005) and to start becoming more independent, while still receiving ample guidance from the instructor in the form of guided questions and then expert answers to which to compare their responses. The week allows further guided exploration with open-ended tutor-led questions, as well as expert answers for students to compare their responses to. Educational technologists and graphic designers developed a large visual interactive depicting each of the triangles with a space for students to submit their answers (see Figure 5), as well as view expert responses from the tutor when they were ready. Once again, this complex and thoughtful design would not have been possible without the support and resourcing of the full MSPACE team.

In each week for the remaining three weeks of the subject (Weeks 4 to 6) learners are provided with a complex written case study covering some key psychiatric disorders:

1. Week 4: Depression

2. Week 5: Anxiety
3. Week 6: Borderline personality disorder.

These weeks start with an explanation of the typical psychodynamic conceptualisations of the disorder, followed by a key reading to elaborate on this. Learners are then provided the clinical case which they work on in groups of four. Two group members apply one each of Malan's triangles to the case, the third draws from the activity of the first two students, combining this information into history, current relationships and the clinical encounter, and the fourth integrates these responses into the formulation. Students can meet synchronously in a webinar room to discuss their responses to the case, or they can post their responses to the discussion board. The group approach to this task allows students to learn from each other's responses and approaches to the case, as well as practicing some of their own, without needing to conduct a full psychodynamic formulation over Weeks 4 to 6 on their own. Hence, students need to be encouraged to practice integrating and applying concepts to clinical cases in order to gain confidence. Hence, Weeks 4 to 6 move to facilitated investigation where students assist each other with their formulations. Across each week the skills required to complete the complex task of a psychodynamic formulation are slowly being scaffolded. Moreover, the subject design allows a tutor to provide contextual feedback to students when they need it, as well as allowing students to assist and facilitate each other's learning.

Hence, in these finals weeks students work together to respond to tutor-led open-ended questions, that allow facilitated investigation. As psychodynamic concepts are quite complicated, the opportunity to practice, learn and discuss with each other and with the tutor is important before students can develop the skills required to conduct an actual psychodynamic formulation independently for their assessment. The thoughtful and interactive design of these weeks allows cognitive, teaching, and social presence, as students are encouraged to construct meaning together in response to teacher-designed tasks. Once again, the complex interactive tasks that were developed in these weeks would not have been possible without the full support and resourcing of MSPACE.

It is interesting to note that when PTP was first launched, students tended to conduct these tasks individually, despite instructions to conduct them in a group. It was not until sign-up sheets for each group were posted to the discussion board that students started implementing the task in the way intended. This demonstrates the importance of clear instructions as well as the impact of minor practical adjustments when implementing group tasks online. The application of design thinking provides a clear teaching presence that guides and scaffolds student learning.

Alongside completion of this weekly content, students are completing assessments. First, students complete a minor assessment, which is a seven minute synchronous webinar presentation presented to the tutor and peers. It was decided to make these presentations student-led, providing them the opportunity to co-construct knowledge with each other, and with some guidance from the SME and the tutor. In this presentation students choose a clinical case from their own clinical experience and discuss psychodynamic themes in the case with reference to theory and their own clinical experiences. This is not a psychodynamic formulation, but rather a chance to start thinking psychodynamically about a case, and to identify individual psychodynamic concepts relevant to the case. Students do not yet need to integrate these concepts into a psychodynamic explanation of the patient's presenting issues. Hence, this assessment is used to help scaffold students towards the major assessment, where a full psychodynamic formulation is required. During the presentation students have the opportunity to discuss the case presented and to learn from each other as well as from the tutor and SME's feedback. Conceptual discussion amongst peers can increase conceptual understanding (Jeong 1998). Scaffolding occurs both by researching and presenting the concepts, and by listening to, and discussing, other students' presentations. Hence, this assessment represents

student-led open-ended learning tasks that allow students to facilitate each other's learning, thereby representing facilitated learning.

For their major assessment, students are required to choose two patients from their own clinical experience who have been diagnosed with one of the disorders covered in Weeks 4 to 6 (i.e. depression, anxiety or borderline personality disorder) and provide a brief (1000 words) psychodynamic formulation of each. It is important that students learn to communicate the psychodynamic formulation briefly, in order to ensure the formulation remains clinically relevant. It would be rare for one mental health professional to communicate a psychodynamic formulation to another mental health professional that is longer than 1000 words, as time is limited for busy mental health professionals. Hence, the tasks are intended to remain authentic. The learning experienced in Weeks 4 to 6 directly prepares students for this major assessment. The assessments acts as a student-led open-ended task, where students are required to become autonomous self-organised learners. The tasks throughout the subject have been carefully crafted to allow students to reach this level of autonomy.

Challenges and implications

In this case study, the systematic team-based approach to the design of the online PTP subject enabled a number of design solutions to be developed, which were informed by the combined technological, pedagogical and content knowledge of the LD and SME specifically, and the production team more broadly. The design solutions allowed students to engage with expert feedback using a framework to support them to develop, integrate and apply their learning to clinically relevant cases. Student satisfaction with the online PTP subject was evidenced by overwhelmingly positive student evaluation ratings (at least equal to that for the face-to-face equivalent subject), no attrition, and by increasing enrolments due to an increasing number of students electing to enrol in the online version rather than the face-to-face version (while there may be several reasons for this, it is proposed that students would be less willing to make this change if the online version of the subject was receiving poor student feedback and had a poor reputation).

One potential area for improvement with the MSPACE approach is that, while the subjects are built by MSPACE, they are delivered by the SMEs within faculty. This means that the learning designer does not gain close insight in to how the subject performed when actually being implemented with students, though the SME does. This disconnect between delivery and learning design may prevent some opportunities for evaluating and improving the subject, as well as opportunities to elicit creative ideas about the subject design and delivery. Hence, perhaps one benefit of developing the SME's pedagogical skills so that they can design and develop fully online subjects in future (rather than working with learning designers) is that the learning design may then benefit from lessons learnt via direct experience delivering the subject. Indeed, an ongoing aim of MSPACE is to develop and impart pedagogical skills to the SMEs that they are working with. At the same time, the SMEs were able to contribute their own specific content expertise to the process. However, in the absence of ongoing evaluation, it is not clear whether this is happening. The authors of this article are currently conducting a qualitative study which partly involves examining whether SMEs are developing such pedagogical skills due to working with MSPACE.

In addition, it is hoped that over time, as educational technologists develop various learning solutions to common pedagogical challenges online, these will be added to a library of tasks that can be readily re-purposed. If so, and the SMEs develop their own pedagogical skills for designing and developing online subjects, the relatively generous resourcing currently provided to online subjects developed at MSPACE may become more scalable across the university.

Conclusions

This case study has presented a discussion of one research-focused university's solution to combine a systematic, team-based approach to developing fully online tertiary subjects that also incorporates design-based thinking that is depicted by the macro, which becomes the blueprint for the subject. While various universities have established different ways to respond to the Age of Disruption, and develop a strategy for building high quality online subjects, each with their pros and cons, the strategy chosen by this university allows a systematic approach to developing high quality online subjects which incorporate bespoke technology to offer solutions to various design challenges. As far as the authors are aware, the University of Melbourne is the only institution that has combined a fully resourced school within the university (MSPACE) to work with SMEs from across all faculties to develop fully online Masters programs at such a large scale, using a design-thinking approach that incorporates a graphic depiction of the design for learning (the macro). This article has attempted to illustrate the benefit of tertiary institutions developing such a systematic design thinking approach to allow pedagogical and technological solutions to various challenges when developing high-quality online subjects. While the approach provided by MSPACE currently focuses on supporting SMEs by providing them access to third-space professionals, it is hoped that this will act as a conduit through which the SMEs are enculturated into the ways of design thinking for effective online teaching and learning practice. This remains to be seen.

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