



Higher Education Research and Development Society of Australasia Inc

Research and Development in Higher Education: Curriculum Transformation

Volume 40

Refereed papers from the
40th HERDSA Annual International Conference

27-30 June 2017
International Convention Center Sydney, Australia

Thomson, E.A., Auhl, G. Hicks, K., McPherson, K., Robinson, C. & Wood, D. (2017). Course design as a collaborative enterprise: Incorporating interdisciplinarity into a backward mapping systems approach to course design in Higher Education. In R.G. Walker & S.B. Bedford (Eds.), *Research and Development in Higher Education: Curriculum Transformation*, 40 (pp 356-367). Sydney, Australia, 27–30 June 2017.

Published 2017 by the
Higher Education Research and Development Society of Australasia, Inc
PO Box 6106, Hammondville, NSW 2214, Australia
www.herdsa.org.au

ISSN 1441 001X
ISBN 978-0-9945546-6-6

This research paper was reviewed using a double blind peer review process that meets DIISR requirements. Two reviewers were appointed on the basis of their independence and they reviewed the full paper devoid of the authors' names and institutions in order to ensure objectivity and anonymity. Papers were reviewed according to specified criteria, including relevance to the conference theme and audience, soundness of the research methods and critical analysis, originality and contribution to scholarship, and clear and coherent presentation of the argument. Following review and acceptance, this full paper was presented at the international conference.

Copyright © 2017 HERDSA and the authors. Apart from any fair dealing for the purposes of research or private study, criticism or review, as permitted under the Copyright, Designs and Patent Act, 2005, this publication may only be reproduced, stored or transmitted, in any form or by any means, with the prior permission in writing of the publishers, or in the case of reprographic reproduction in accordance with the terms and licenses issued by the Copyright Licensing Agency. Enquiries concerning reproduction outside those terms should be sent to the publishers at the address above.

Course design as a collaborative enterprise: Incorporating interdisciplinarity into a backward mapping systems approach to course design in Higher Education

Elizabeth A Thomson

Charles Sturt University, Wagga Wagga, Australia
ethomson@csu.edu.au

Greg Auhl

Charles Sturt University, Bathurst, Australia
gauhl@csu.edu.au

Kerri Hicks

Charles Sturt University, Orange, Australia
khicks@csu.edu.au

Kerstin McPherson

Charles Sturt University, Albury, Australia
kmcpherson@csu.edu.au

Caroline Robinson

Charles Sturt University, Albury, Australia
corobinson@csu.edu.au

Denise Wood

Charles Sturt University, Bathurst, Australia
dwood@csu.edu.au

The Higher Education sector in Australia is no longer protected by its national border. Traditional universities across Australia are experiencing competition unlike anything that has occurred in the past (Universities Australia 2013; Norton 2013; Ernst & Young 2012; Maringe and Sing 2014; Stromquist and Monkman 2014). In this climate, the need to be distinctive and able to offer something *more* to the student is part of a counter response to greater competition (Seimens 2004). Charles Sturt University has approached this challenge by recognising the need for quality improvements in learning and teaching. CSU has introduced a university-wide, collaborative course design process to address this. Through a process of backward mapping, learning outcomes, learning experiences and authentic assessment tasks are aligned with a set of graduate attributes comprising both industry and professional standards. The value of this interdisciplinary collaboration is important to highlight, as it facilitates a creative and innovative approach to curriculum design. Academic and professional staff external to a course team/School/Faculty, offer new perspectives which academics within a specific discipline may not conceive when working in relative isolation. Using this model of working, course review becomes a process which facilitates 'boundary spanning'. This paper presents a case study – a Bachelor of Physiotherapy - which illustrates the application of this backward mapping approach to curriculum design. This approach of interdisciplinary collaboration and iterative feedback enabled a philosophical shift away from the historical medical model to a holistic social model of health provision.

Keywords: collaboration, critical feedback, constructive alignment.

Introduction

As competition in the Australian higher education sector increases (Universities Australia 2013; Norton 2013), the need to lift the undergraduate student experience increases as well. The *emotionally attached* student can contribute to increased enrolment through informal, *word-of-mouth* recommendations (da Rosa Borges & de Mello 2015). But beyond sector pressures, to remain competitive, lifting the student experience is more about quality education which is now of interest to governments as they link funding to quality through the Tertiary Education Quality and Standards Agency (TEQSA). Universities need to be able to demonstrate quality systematically across their suite of courses (degrees) to satisfy the external, government quality assurance requirement.

Since TEQSA began quality assuring learning and teaching across the Australian higher education sector, a spotlight has been directed towards quality course design, not just randomly but systematically across the universities' course offerings. Traditionally across Australia, course design involved subject offerings designed by individual academics, arranged into a plausible course of study within the scope of recommendations provided by a review panel comprising internal and external members. While this process takes the external environment relevant to each course into account, it does not necessarily systematise the process of ensuring alignment of TEQSA and industry standards to learning outcomes and assessment. Typically without a commonly applied process to enable constructive alignment, it is difficult to know if alignment is achieved both within a subject and between subjects within a course of study. It can be argued that in some cases, courses are made up of a range of subjects pieced together more like a jigsaw – subjects that 'fit' together to form a whole – rather than a coherent course of study relevant to industry and the employment needs of students, built to specifications arising from needs analyses. In addition, this jigsaw model might not consider the student learning experience across the whole course, increasing the risk of redundant content, inadequate attention to pedagogy, inappropriate assessment, or over assessment. This approach to course design may result from an isolated effort by an individual course director who leads the course review process, removed from other course reviews, or from a course team attempting to bring all stakeholders into the process but isolated from the broader context. This isolated manner resembles a cottage industry (T. Downes, personal communication, June 1, 2016) rather than an 'industrial' systems approach.

To address this cottage industry approach to course design and the risks it poses to course quality, universities need to consider institution-wide, systematic approaches to course design which place a 'quality' student experience at the core of the endeavor. Not only can a systematised approach address TEQSA requirements, it is assumed that it could also lift quality to positively impact the student experience.

An example of a systematised course design approach has been introduced at Charles Sturt University (CSU). The initiative entitled Smart Learning (SL) began in 2011 in the Faculty of Education and evolved to include both the methodology and technologies for a university-wide approach to course design and approval process (Bain, 2013). The SL model is based upon a design theory first developed for K-12 Education (Bain, 2007) and then tested in higher education course design (Zundans-Fraser, 2014; Lancaster, 2017). The research underpinnings of SL incorporate principles of collaboration and consensus as well as constructive alignment, criterion-based assessment, emergent feedback and intentional learning design (Bain and Zundans-Fraser, 2016; Zundans-Fraser & Bain, 2016; Zundans-Fraser & Auhl, 2016). The development of a bespoke design software programme

CourseSpace© enables transparent and informed backward course design. The software comprises design components that enable a team to collaboratively create and evaluate a course, and submit the course for internal accreditation. It is a dynamic tool that enables building course components, mapping and asynchronous feedback at all stages of the process and facilitates the active engagement of all stakeholders. Examples of the application of the tools including their approach to learning analytics and feedback are described in Bain and Drengenberg (2016), Bain and Zundans-Fraser (2017), Zundans-Fraser, Hill and Bain (2017) and Auhl, Gainsford, Hill & Zundans-Fraser (2017).

The system and process were piloted over 2012-2013 with the review and major reconstruction of the Bachelor of Education (Early Childhood and Primary), working with both faculty and school level academics to test the concept, and trial the software tool, *CourseSpace*©. It is expected that by the end of 2018, undergraduate courses with 80% of student load will have been reviewed using this systems approach. The expectation is that a systematic design process will positively impact student engagement, hence their overall educational experience (Kahu, 2011), requiring that institutions “intentionally design all curricula and co-curricular activities to activate student motivation, build academic skills, promote discipline and student identity, and develop student’s self efficacy”(Shaping the 21st Century: Student experiences at regional universities, n.d.) which will be measured through the Student Experience Survey (SES).

This paper argues for an institution-wide, collaborative approach to course design which frames a fluid, creative design process within a construct of aligned learning outcomes, student learning experiences and assessment in order to lift quality and provide a foundation for an improved student experience at CSU. Using the experience of the Bachelor of Physiotherapy as a case study, this paper will argue for the adoption of a collaborative systems approach to design on the basis that such a process affords the opportunity for collaboration, critical feedback and consensus building; the inclusion of interdisciplinary perspectives; the constructive alignment of standards, learning outcomes and assessment; and a design integrity across and within subjects from design to development through to delivery.

Literature Review

This section will briefly review the literature relevant to collaboration and backward design in the construction of higher education programs, as these principles underpin the CSU course design process.

The issue of quality courses, teaching and learning in higher education has become a global phenomenon over the last decade (Ho, 2000). In the Australian context, this need for quality resulted in the establishment of the Tertiary Education Quality and Standards Agency (TEQSA) in 2011, as a result of the *Bradley Review of Australian Higher Education* (Bradley, Noonan, Nugent & Scales, 2008). While TEQSA is responsible for the ongoing review and accreditation of tertiary institutions, ongoing research programs aimed at enhancing the quality of learning and teaching in higher education settings have been initiated, both nationally and internationally (Henard & Roseveare, 2012). Additionally, the need for theory to underpin “substantive and sustainable curriculum reform” (Bain & Zundans-Fraser, 2016, p. 4) has become the focus for a number of researchers.

Collaboration

The importance of collaboration between academics in developing quality courses is described by Zundans-Fraser & Bain (2015), while Chao, Saj & Hamilton (2010) recognise the need to extend this and for collaborative groups to provide different sources of expertise in a process where there are different drivers (such as the need for online delivery) at play within the higher education sector. Friend & Cook (2013) describe a collaborative style as having a number of defining characteristics including being voluntary in nature; requiring parity among participants; being based on mutual goals; involving shared responsibility for participation and decision making; sharing resources; and sharing accountability. Multidisciplinary collaborations are a common theme in much of the literature focussed on driving improved quality in higher education (Henard & Roseveare, 2012; Zundans-Fraser, 2014). For collaborative groups to be successful in higher education, the capacity to build respectful and trusting relationships is essential (Daniel, Auhl & Hastings, 2013). Such relational trust has a number of dimensions described by Edwards-Groves, Grootenboer & Ronneman (2016) as contributing to a culture where individuals value working with others toward a common end point. These dimensions of interpersonal trust; interactional trust; intersubjective trust; intellectual trust; and pragmatic trust intertwine to create a collective intelligence. In self-organising systems, this pooling of ideas from individuals allows participants to “transcend their individual capacities” (Bain, 2007, p. 42). Despite, however, widespread recognition that collaborative practice carries significant benefits “teachers in universities continue to work largely in isolation” (Bain & Zundans-Fraser, 2016, p. 5). In the context of CSU, it was determined that any systems approach to design needed to be collaborative in nature in order to drive quality consistently across the university.

Application of theoretical frameworks to course design has provided guidance and direction in ensuring a consistent approach to the processes required. Bain (2007) describes six key theoretical principles from the fields of self-organisation and complex adaptive systems to help organisations in this work. These six principles are: simple rules; embedded design; emergent feedback; similarity at scale; dispersed control; and common schema. For the purposes of this paper, dispersed control and emergent feedback are the foci. Dispersed control provides the capacity for all agents involved in an enterprise to fully share in both the development and ownership of the enterprise. It allows for the collective intelligence within a group to emerge and for bottom-up feedback to occur (Bain, 2007). This emergent feedback allows the system to talk to itself, informing the next stage of evolution (Pascale, Millemann & Gioja, 2000). Thus, in educational contexts, self-organisation can be applied in the development of approaches that encourage change and adaptation through feedback, ensuring bottom-up solutions to needs and problems (Bain, 2007). Problem solving can occur collaboratively, through the collective intelligence within a group, providing solutions that reflect the capacities of the group rather than an individual.

Backward Design

SL incorporates the concept of backward design explicated by Wiggins & Tighe (2005) for school based education, as a way of achieving better outcomes for school students in the context of standards based education. Recognising the impact of external standards, and the expectation of improved results and tangible evidence of student achievement in a climate of accountability, they described a major cognitive shift in how teachers needed to consider their planning and teaching. Learning, evidenced in student output, was the focus of backward design rather than teaching which was the conventional focus of thinking when planning for learning.

Backward design is an intentional, informed, contextual process focussed in ‘big picture’ outcomes (Wiggins & Tighe, 2005). It systematically maps a clear pathway to specific and explicit learning goals, positioning a range of experiences and opportunities along the pathway to support learners to successfully complete assessment tasks that demonstrate achievement of the goals. The design team defines the standards to be achieved and articulates the evidence required to demonstrate successful achievement (Mowatt, 2010). They then must consider and describe the assessment practices and tasks that will provide this evidence. This includes defining what will be assessed, and understanding how this connects to the goals. Careful consideration of the appropriate learning experience, content and opportunities to enable successful student completion of the assessments is undertaken and connections are identified.

Throughout the process, the various components are revisited so that the links between outcomes, assessments and activities are embedded in the design. The pathways that will support students to acquire understanding of concepts and their application in the real world are defined. This is the strength of the backward design approach to curriculum design (Emory, 2014; Wiggins & Tighe, 2005). Students know where they are heading as they learn. The end is always in mind and visible.

Graduates of today’s higher education institutions will enter a world where knowing is not enough. They need to understand, apply and critically analyse the abundance of knowledge that is in their world. There is a demand for a greater clarity of outcome. The process of higher education course design for professional learning needs to be transformed to ensure an overall learning experience, authentic for the professions, that connects theory and practice in a concrete way (Emory, 2014; Gaff, 2011). Backward design allows for layering, whereby student achievement at both subject and course level can be described (Mowatt, 2010). Each subject defines its particular goals and includes assessments and learning experiences designed to meet these goals, while concurrently having a clear place in the design overall of the course. Subjects scaffold, connect and build student knowledge and skill, providing for evidence of the achievement of the course goals. Both Emory (2014) and Graff (2011) describe situations where backward design provided for students in nursing and teaching respectively, the deep knowledge and understanding of their undergraduate content that enabled them to apply, adapt and innovate in the workplace. Both expressed a key strength of backward design as an intentionality that resulted in ‘deliberate connections between student outcomes and course structure, content and delivery methods’ (Emory, 2014 p. 123).

The course design process

This intentionality is reflected in the introduction of the CSU university-wide course design process that is iterative, with collaboration and feedback as its central tenets. Figure 1 contextualises this course design process in the broader learning and teaching cycle. In the *selection and preparation* stages, course performance and market analysis inform the initial planning, including the formation of a course design team. A Course Design Lead facilitates the team throughout the design process in the role of curriculum consultant. Teams are oriented and equipped through professional development to create clear goals and plans for the collaborative design process.

Figure 1: The course design process

In Design Phase 1, ‘Baseline’ includes a deep analysis of the strengths, needs, drivers and risks to the course, and an articulation of shared commitments for the design. A conceptual model is created to illustrate the structure and elements of the course. The team interrogates the criteria that drive the course including professional standards, CSU’s distinctive graduate learning outcomes (GLOs) and AQF standards to form a unique integrated set of standards as a point of reference for the ensuing design. ‘Products’ broadly describe the evidence that students will demonstrate and produce during the course to show they have achieved the standards. The products form the framework for the development of authentic and explicit assessment tasks.

In Phase 2, individual academics develop assessment tasks in a transparent and collaborative manner that results in the development of an assessment map for the course prior to subject development. The process supports the building of high quality criterion-referenced and standards-based assessment items aligned to the products and therefore, the standards. The assessment tasks are mapped to subjects and subject learning outcomes to ensure constructive alignment.

Modules within individual subjects are developed in Phase 3, to address the needs of assessment tasks. These are a planned set of learning events that specify evidence based pedagogy and delivery strategies, as well as content and resources. Modules describe the

content and learning experiences that will enable students to successfully complete the assessment tasks and achieve the course standards (learning outcomes).

At the completion of each design phase the course is submitted for formative approval through governance processes. Approval requires evidence of feedback gathered from a diverse range of academics in an iterative cyclical process. Team members and other stakeholders provide feedback through a series of Likert scale questions that address the quality of the design component, constructive alignment, strengths and needs, and comments that make recommendations. The Course Director collates and analyses the feedback, reports back and if needed, seeks further feedback. This process generates ongoing focussed conversations with stakeholders about elements of the course and its design. CourseSpace© affords a collation and visual representation of the feedback that informs the governance process.

The review of the Bachelor of Physiotherapy

The former Bachelor of Physiotherapy at CSU was aligned with the Australian Standards for Physiotherapy (Australian Physiotherapy Council, 2006). The four year, face-to-face course was predicated on a medical health model; skills focused with an emphasis on students being deemed competent in the clinical domains of Physiotherapy practice. It comprised all core subjects with one unrestricted elective. The curriculum was informed by clinical subjects and comprised elements of problem based learning, to enable the development of skills in reflection, clinical reasoning, teamwork and leadership. Some of the assessment tasks, however, allowed students to achieve a passing grade with only a superficial level of engagement with the subject content. Subjects in the course were designed in relative isolation and ongoing staffing changes in the course team negatively impacted the process of subject review and development. Subjects and assessments were vulnerable to modification by individual subject coordinators, without due regard and respect for the consequent impact upon other subjects and the course as a whole.

The stimulus for course review was precipitated by publication of the Physiotherapy Practice Thresholds Australia and Aotearoa New Zealand, in 2015. Additionally, internal drivers at CSU focused attention on the need to implement the CSU course design process, align course and subject level outcomes with the CSU GLOs; implement policy initiatives in ‘Indigenous Australian Content in the Curriculum’ and ‘English Language, Literacy and Numeracy’ (ELLaN). CSU’s Student Experience Survey (2014-2016) data also identified the need to improve the authenticity and relevance of assessment tasks. In contrast to the previous set of professional standards, the new ‘Practice Thresholds’ focus more on the role of the physiotherapy practitioner and personal attributes rather than the development of competency through the acquisition of technical skills. A key aspect of the ‘Practice Thresholds’ is cultural competence, requiring a “holistic client-centred approach to practice” (Australian Physiotherapy Council, 2015 p.10). The primary aim is to develop graduates who will seamlessly integrate physiotherapy discipline-specific knowledge with a social and cultural conscience, in essence, to develop physiotherapists with a different world view. The aims and outcomes for the new course represent the development of the undergraduate student as a holistic practitioner with a socio-cultural perspective on health and wellbeing. Subject outcomes have been designed to direct the students’ attention to person-focused practice.

The Physiotherapy course team had a core and extended group. The core group involved the Course Director, Discipline Lead, four Physiotherapy academics, Course Design Lead and an Educational Designer. The extended group involved Physiotherapy academics and depending on the task, experts such as Library or Academic Skills advisers. The course team was fully engaged with the process of curriculum review, viewing it as an opportunity to collaborate and to take ownership of the course. Many of the staff had no prior experience of course review and therefore approached the process with naive enthusiasm. A strong sense of responsibility for the course, from the Physiotherapy course team, enabled a strengthening of relationships between staff at geographically distant campuses. This capacity building of the course team as a consequence of the course review process, is a tacit outcome which is important to articulate. It is testament to the motivation of the academics in the course team under cohesive leadership of the Physiotherapy Discipline Leader and the Course Director. The allocation of workload, with clear outcomes and deadlines, enabled space for creative course design. Another vital element to achieving success is the close working relationship between the Educational Designer (ED) and academics in the course team. This collaboration through course review enabled academics to better understand the pedagogical expertise of the ED and to value their different perspective on constructive alignment, assessment design, and the development of marking criteria.

Interdisciplinary collaboration is an important feature of this approach to course review, permitting new perspectives on the knowledge, skills and attributes required for an entry-level Physiotherapist. The curriculum design process was strengthened through collaboration with academics in the School of Indigenous Australian Studies (SIAS) and a range of academic GLO advisers, who contributed expertise in a broad range of domains: Academic Language, Literacy and Numeracy; Digital Literacies; Ethics; Global Citizenship; Indigenous Cultural Competence; Information and Research Literacies; Lifelong Learning; Professional Practice; Sustainable Practice. Working with academics external to the course team/School/Faculty assisted the Physiotherapy academics in understanding HOW to scaffold students' learning through the constructive alignment of authentic assessment tasks, learning outcomes and subject content. This is illustrated well in relation to Indigenous Australian content. Through the development of relationships with Indigenous academics, the non-Indigenous Physiotherapy academics were able to appreciate more clearly, the importance of establishing respectful partnerships and the cultural competency journey. This knowledge informed the review of subject learning outcomes and assessment task design, and illustrates the value of authentic engagement in the course review process. Course review is a mechanism to enable action and implement change; interdisciplinary collaboration is crucial to ensure that a course team embraces new ways of seeing and doing.

Implementation of university policy at the School and Faculty level, also enabled opportunities for interdisciplinary conversations which informed the course review for example, the English Language, Literacy and Numeracy (ELLaN) Policy. New relationships were developed between academics in the Physiotherapy course team and academics in the Division of Student Learning through subject development work. The value of these interdisciplinary relationships extends beyond the official course review period and is evidenced by ongoing collaboration which continues to build capacity in the Physiotherapy course team. Staff have extended their knowledge and skills in assessment task design and articulating learning outcomes, which will result in an improved experience for students. At a Faculty level the course review process enabled collaboration between Course Directors, Heads of School, the Faculty Executive and the Division of Student Learning. These Faculty

level discussions are an important adjunct to the work of academics in the School, to share examples of good practice and to provide feedback on the logistics of policy implementation.

A guiding principle for design of the course was the development of a set of subjects – PHS100 – Introduction to Physiotherapy Clinical Practice, PHS250 – Evolving Physiotherapy Clinical Practice, PHS350 – Integrated Chronic Health Condition Management and PHS403 – Rural and Remote Physiotherapy – referred to as ‘the spine’. These key subjects scaffold problem-based learning through the course, facilitating students’ learning of discipline specific knowledge in the broader socio-cultural health context. The shift to emphasise person-focused practice in the course has stimulated creativity in assessment design. Collaboration with media services has enabled the production of online learning resources for PHS100 – interviews with Physiotherapy practitioners to enable student reflection on practice and possible career trajectories. Opportunities to host yarning sessions with Aboriginal Elders local to each campus, is a mechanism to engage students with Indigenous Australian issues and to facilitate personal journeys towards cultural competence. Careful scaffolding of Indigenous Australian learning outcomes and subject content in the course enables students to first understand their own culture before they engage with learning about other cultures and the factors affecting health and wellbeing. PHS403 as the final subject in ‘the spine’, defines the whole physiotherapy course. This capstone subject comprises a collaborative project with Aboriginal and Torres Strait Islander peoples and their communities, enabling exploration of the socio-cultural, environmental and political determinants of health, and facilitating culturally safe Physiotherapy practice. This community focused and discipline specific project will enable authentic learning in the workplace, which is highly relevant preparation for Physiotherapy graduates who will practice in regional, rural and remote locations in Australia.

Having completed the review, the course team have been reflecting on the experience and have noted the following positive outcomes and challenges. The process of collaborative decision-making during course review was positive and has broken down some of the barriers which can be built around individual subjects. Through the series of open discussions about the purpose of the course and the overarching aims and outcomes, academics became less protective about the subjects they coordinated and every member of the course team contributed to constructive alignment of the individual parts to form the whole. Collaboration with, and feedback from, colleagues external to the Physiotherapy team enabled new perspectives on the course and constituent subjects. For example, inclusion of the advisor for Academic Literacy, Learning and Numeracy provided an important stimulus for academics to consider how individual subjects would serve to scaffold the students’ skills in academic reading and writing. Development of these foundational skills through a course may be at risk of being taken for granted and not made explicit by a team of academics with a primary focus on disciplinary knowledge and skills.

One of the challenges to effective course review and curriculum design is the amount of time required for staff to participate in meetings and to engage in the iterative process of drafting, editing and re-writing at each stage of the process. The course team approach requires workload allocation and an understanding by Heads of School of the workload requirement in order to ensure that time and opportunity are available to authentically engage in collaboration. Another challenge arising from the experience relates to the issue of security of the carefully constructed assessment items. They are at risk of being modified if individual subject coordinators, or academics new to the staff team, modify assessment items without taking the re-design into consideration. This potential highlights the need to protect the integrity of design. To address this issue there are discussions at university level in relation to

governance around integrity of design. The university is preparing to introduce an approval way point prior to delivery to ensure integrity of design.

Conclusion

This study highlighted some clear resonances with the importance of interdisciplinary collaboration, as described in the literature. Individual's different sources of expertise, described by Chao, Saj & Hamilton (2010), contributed to a collective intelligence from their voluntary participation in a process with a common goal. This process allowed the development of a quality course that, through the emergent feedback from a variety of stakeholders, developed not only the necessary professional knowledge, skills and attitudes but also a wider set of graduate attributes.

We consider that the process described in the case study is an approach to meeting the external requirements for professions and or vocations, but that it can also contribute to an improvement in the quality of more liberal arts and general studies degrees to offer students valuable learning for 21st century life. Regardless of degree type, working collaboratively as a course design team exposes the connectedness in terms of key issues for all discipline groups and potentially produces different perspectives and ways of aligning learning opportunities. As the team designs a course as a holistic entity, considering the scaffolding between subjects, the connections between content and the over-arching skills that students will achieve, they are laying the foundational learning experiences for graduates who will assimilate knowledge and produce new ways of understanding. The interdisciplinary approach of this course design process opens the possibility for integrated assessments, combined teaching and shared perspectives as the course design team considers the student learning experience holistically. What potentially emerges is a liberal arts, or a professional degree, built on new disciplinary connections, new fields of study and critical analysis of how knowledge has traditionally been perceived. Our world seeks individuals who can challenge existing orders and build new ways of addressing issues. Graduates who are agile in their thinking, able to adapt content and draw connections between divergent ideas and concepts will be able to address multi-faceted problems throughout their working life.

This paper has presented a case study of the Bachelor of Physiotherapy to illustrate the application of the CSU systems approach to collaborative course design using backward mapping. This case study demonstrates a cultural shift away from an isolated, cottage-industry approach in which subjects may function as jigsaw pieces to a collaborative, interdisciplinary approach where the professional standards and graduate learning outcomes set the scene for a backwardly mapped, constructively aligned course design. In addition to the expectation that this approach will contribute to enhance course quality, it has enabled a philosophical shift away from the historical medical model to a holistic social model of health provision. In the words of the Course Director,

The Bachelor of Physiotherapy is now more holistic and addresses issues which are not typically well represented in professional standards such as sustainability and global citizenship. (C. Robinson, Course Director, Bachelor of Physiotherapy personal Communication, August 25, 2016)

References

- Auhl, G., Gainsford, A., Hill, B., & Zundans-Fraser, L. (in press). "Strong foundations, stronger futures: Using theory-based design to embed Indigenous Australian content in a teacher education programme". In Paul Whitinui, Carmen Rodriguez de France and Onowa McIvor (eds.) *Promising practices in indigenous teacher education*. New York: Springer Education.
- Australian Government Office for Learning and Teaching (2016). *Shaping the 21st Century: Student experiences at regional universities*. Canberra: Australian Government Office for Learning and Teaching.
- Accessed from <http://shapingtheregionalstudentexperience.com.au/>
- Australian Physiotherapy Council (2006). *Australian Standards for Physiotherapy*. Australian Physiotherapy Council, Canberra
- Australian Physiotherapy Council (2015). *Physiotherapy practice thresholds in Australia and Aotearoa New Zealand*. Australian Physiotherapy Council, Canberra
- Bain, A. (2013, February 4). *Smart Learning*. Charles Sturt University. (Commercial in Confidence).
- Bain, A. and Charles Sturt University (2012). *Smart Tools (Versions 1.0 and 2.0)* Copyright © Computer Software. Bathurst, NSW: Charles Sturt University
- Bain, A. (2007). *The Self-Organising School: Next generation comprehensive school reform*. Maryland: Rowman & Littlefield Education.
- Bain, A., & Drengenberg, N. (2016). *Transforming the measurement of learning and teaching in higher education*. New York: Routledge
- Bain, A., & Zundans-Fraser, L. (in press) *The Self-organizing University: Designing the Higher Education Organization for Quality Learning and Teaching*. Singapore: Springer.
- Bain, A., & Zundans-Fraser, L. (2016). *Rising to the challenge of transforming higher education: Designing universities for learning and teaching*. Singapore: Springer Briefs in Education.
- Bradley, D., Noonan, P., Nugent, H., & Scales, B. (2008). *Review of Australian higher education: Final report*. Canberra: Department of Education, Employment and Workplace Relations.
- Chao, I., Saj, T., & Hamilton, D. (2010). Using collaborative course development to achieve online course quality standards. *The International Review Of Research In Open And Distributed Learning*, 11(3), 106-126. Retrieved from <http://www.irrodl.org/index.php/irrodl/article/view/912/1644>
- Da Rose Borges, G., & de Mello, S.P.T. (2015). The influence of students attachment in the recommendation of a federal public university in Brazil. *Business and Management Review, Special Issue, Vol4, N5, January 2015*, 305-312.
- Daniel, G. R., Auhl, G., & Hastings, W. (2013). Collaborative feedback and reflection for professional growth: Preparing first-year pre-service teachers for participation in the community of practice. *Asia-Pacific Journal of Teacher Education*, 41(2), 159-172.
- Edwards-Groves, C., Grootenboer, P., & Ronnerman, K. (2016). Facilitating a culture of relational trust in school-based action research: Recognising the role of middle leaders. *Educational Action Research*, 24(3), 369 - 386
- Emory, J. (2014). Understanding backward design to strengthen curriculum models. *Nurse Educator*, 39(3), pp. 122-125
- Friend, M., & Cook, L. (2013). *Interactions: Collaboration Skills for School Professionals* (7th edn). Boston: Pearson.
- Graff, N. (2011). "An effective and agonising way to learn": backward design and new teachers' preparation for planning curriculum. *Teacher Education Quarterly, Summer*, pp. 151-168
- Henard, F., & Roseveare, D. (2012). *Fostering quality teaching in higher education: Policies and practices. An IMHE guide for higher education institutions*. Paris: OECD
- Ho, A. S. P. (2000). A conceptual change approach to staff development: A model for programme design. *The International Journal for Academic Development*, 5(1), 537-547.
- Kahu, E. R. (2011). Framing student engagement in higher education. *Studies in Higher Education*, 38(5), 758 – 773.
- Lancaster, J. (2017). *The Instantiation of Theory into Practice for Preservice Teachers in Inclusive Education. Unpublished doctoral dissertation*. Charles Sturt University, Bathurst
- Mowatt, R. A. (2010). To begin with the end in mind: backward design in leisure studies. *Schole*, 25, pp.141-145. NJ: Prentice Hall.
- Pascale, R. T., Millemann, M., & Gioja, L. (2000). *The new laws of nature and the new laws of business*. New York: Crown.
- Wiggins, G., & McTighe, J. (2005). *Understanding by design* (2nd ed.). Upper Saddle River: Association for Supervision and Curriculum Development

- Zundans-Fraser, L. (2014). *Self-organisation in course design: A collaborative, theory-based approach to course development in inclusive education*. Unpublished doctoral dissertation. Charles Sturt University, Bathurst
- Zundans-Fraser, L., Hill, B., & Bain, A. (in press). "Strong foundations, stronger futures: Using theory-based design to embed Indigenous Australian content in a teacher education programme". In Paul Whitinui, Carmen Rodriguez de France and Onowa McIvor (eds.) *Promising practices in indigenous teacher education*. New York: Springer Education.
- Zundans-Fraser, L., & Auhl, G. (2016). A Theory-driven Approach to Subject Design in Teacher Education. *Australian Journal of Teacher Education*, Vol 41, 3 March 2016
- Zundans-Fraser, L., & Bain, A. (2016). The role of collaboration in a comprehensive programme design process in inclusive education. *International Journal of Inclusive Education*, 20(2), 136-148.

Copyright © 2017 Elizabeth Thomson, Greg Auhl, Kerri Hicks, Kertin McPherson, Caroline Robinson and Denise Wood. The authors assign to HERDSA and educational non-profit institutions a non-exclusive license to use this document for personal use and in courses of instruction provided that the article is used in full and this copyright statement is reproduced. The authors also grant a non-exclusive license to HERDSA to publish this document in full on the World Wide Web (prime site and mirrors) and within the portable electronic format HERDSA 2017 conference proceedings. Any other usage is prohibited without the express permission of the authors.