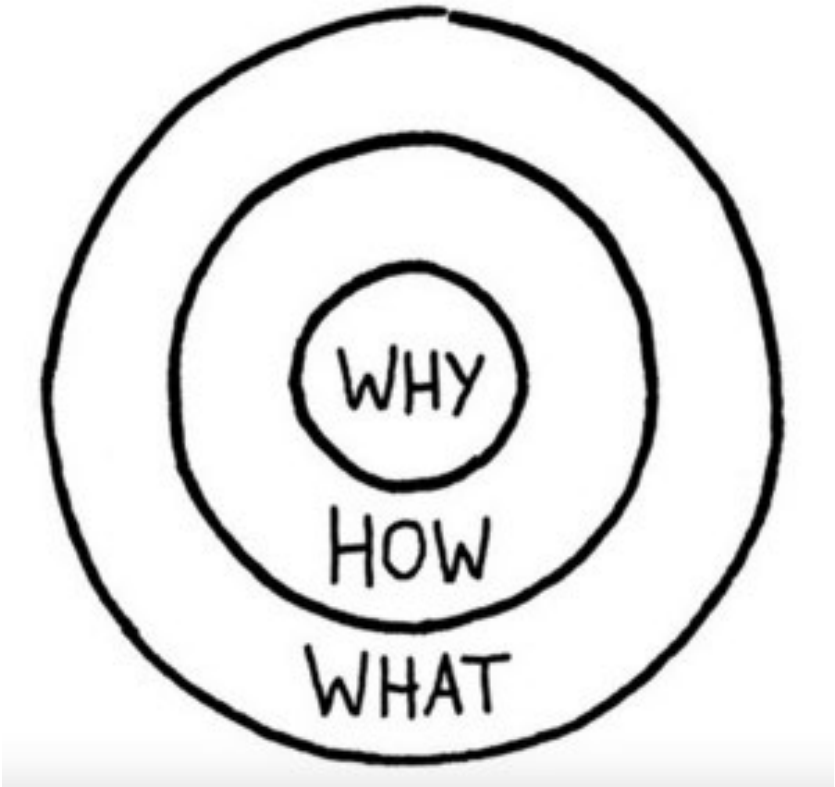
Service Teaching

Academia's most boring topic?

Does anyone even publish on "service teaching"

- Service teaching
- Cross faculty teaching
- Teaching science to other disciplines

The Golden Circle



Simon Sinek

What: everyone knows what we do (service teaching)

How: some know how we do it – what sets you apart from your competition

Why: few know why (not to provide education = outcome. Why: is the purpose, cause, belief – the reason your institution exists

What How Why

We make great computers, they are well designed, simple to use and user friendly – do you want to buy one? - meh

Why How What

Apple:

With everything we do, we believe in challenging the status quo, we believe in thinking differently.

The way we challenge the status quo is to make our products well designed, simple to use, user friendly

We just happen to make great computers – want to buy one?

- People don't buy what you do, people buy why you do it.

- Do we focus on content or learning processes?
- Do we focus on content or application (in/outside of context)?
- Do we focus on content or why its important that students engage with the learning activities?

- How many academics explain to their students why they are studying their subjects/courses/feedback? How their service teaching subject fits into someone else's degree!

- Literature review of “service teaching” = nothing
- Concepts of teaching “service” = service to community, to industry to government

Cross faculty/ discipline teaching

- Lots of literature in the secondary school space
- Some interesting lessons to learnt from this space:

Connecting with other Disciplines: Rogers, Meredith A. Park, Abell, Sandra K: Science and Children, Feb 2007
URL: https://www.questia.com/read/1G1-160813645/connecting-with-other-disciplines Accessed 14/7/2019

- Interdisciplinary instruction is a way of approaching curriculum by organizing content and processes from more than one discipline around a central theme, issue, problem, topic, or experience (Jacobs 1989).

- Reading and writing instruction can connect to science through the reciprocal use of process skills, such as observing, comparing/contrasting, inferring, explaining with evidence, and communicating (Baker and Saul 1994; Casteel and Isom 1994; Glynn and Muth 1994).

- By weaving big ideas and important skills from different disciplines, teachers can maximize classroom time and reinforce concepts and skills across subjects.

- Instructional approaches that integrate curriculum have gained support from the field of cognitive science, where researchers suggest that learning big ideas and frameworks is more powerful than learning individual or fragmented ideas (Caine and Caine 1993; Donovan and Bransford 2005).

- For all the potential benefits, an interdisciplinary approach also generates concerns…..

- blurring disciplinary boundaries devalues the content of each discipline and student learning becomes superficial (Beane 1995; Dickinson and Young 1998).

- Roth (1994) expressed the concern that, in elementary classrooms where thematic interdisciplinary approaches are used, the science instruction that occurs may do more harm than good. In particular, "the content of theme units often [does] not focus on the powerful ideas or organizing concepts from the disciplines“

- an interdisciplinary approach may benefit one discipline more than another.

Blended Science: The Rewards and Challenges of Integrating the Science Disciplines for Instruction. William F. McComas, HsingChi A. Wang

https://doi.org/10.1111/j.1949-8594.1998.tb17430.x

Abstract

This paper provides an overview of blended science instruction, a term used to represent instructional plans by which the science disciplines are connected to each other and occasionally to other school subjects. The central rationales for such instruction, the historical development of blended instructional plans, and a review of the current proponents and forms of such instruction are provided. The primary varieties of blended instruction, including integrated, unified, and coordinated science, are compared and contrasted. Special attention is given to the major recommendations in support of blended science coming from philosophical, psychological, pedagogical, and pragmatic domains. The conclusions section includes some of the challenges facing those who plan an integrated teaching focus.

But what about the HE space

The oldies but the goodies

A phenomenographic study of academics' conceptions of science learning and teaching: Michael Prosser, KeithTrigwell, PhilipTaylor. **Learning and Instruction:** Volume 4, Issue 3, 1994, Pages 217-231. https://doi.org/10.1016/0959-4752(94)90024-8

investigation of the conceptions of teaching and learning held by teachers of first year university chemistry and physics courses

information transmission to facilitating conceptual change in teaching

knowledge accumulation to conceptual change in learning

Much of the recent research on student learning in sciences has shown that students exhibit substantial conceptual misunderstandings even after passing university examination on the topic

Is this is to be addressed, educators need to adopt conceptions of their teaching consistent with:

- Conceptual development and conceptual change to meet internal demands (i.e. not focusing on outcomes)

Looking Beyond Content: Skill Development for Engineers: Edward F. Redish, Karl A. Smith Journal of Engineering Education, 2013. https://doi.org/10.1002/j.2168-9830.2008.tb00980.x

Focuses on helping students develop skills and an adaptive expertise. Using phenomenological guidelines for instruction arising out of cognitive load theories. Developing a more detailed understanding of the specific skill of using mathematics in modelling physical situations.

A cross-faculty simulation model for authentic learning. Innovations in Education and Teaching International: 48, 2001. Susannah Diamond , Andrew Middleton & Richard Mather

https://doi.org/10.1080/14703297.2010.518423

- Details a cross-faculty project in which UK HE students acted as professional developers to produce prototype educational games for academic clients from other subject areas. The stakeholders believed the cross-faculty simulation to be a motivating learning experience, whilst identifying possible improvements.

Strategies and effectiveness of teaching universal design in a cross-faculty setting. Teaching in Higher Education. Valerie Watchorn , Helen Larkin , Susan Ang & Danielle Hitch . 2013. https://doi.org/10.1080/13562517.2012.752730

- Universal design education is applicable to both architecture and occupational therapy students, yet there are few published examples of this content being embedded within curricula and only one that involves a small sample of occupational therapy students.

What did we learn from HE literature

- No one actually writes about service teaching in any serious way so there is an opportunity for those interested

- But there was one concept that was relevant to the ideas of equity - Universal Design

Principle	Descriptor
(1) Equitable use	The design is useful and marketable to people with diverse abilities
(2) Flexibility in use	The design accommodates a wide range of individual preferences and abilities
(3) Simple and intuitive use	Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills or current concentration level
(4) Perceptible information	The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities
(5) Tolerance for error	The design minimizes hazards and the adverse consequences of accidental or unintended actions
(6) Low physical effort	The design can be used efficiently and comfortably and with a minimum of fatigue
(7) Size and space for approach and use	Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture or mobility

Source: Connell et al. 1997 Connell , B. R. , M. Jones , R. Mace , J. Mueller , A. Mullick , E. Ostroff , J. Sanford , E. Steinfeld , M. Story , and G. Vanderheiden . 1997 . The Principles of Universal Design – Version 2.0 . Raleigh , NC : North Carolina State University http://www.ncsu.edu/www/ncsu/design/sod5/cud/about_ud/udprinciplestext.htm .

Reyna Zeballos, J. L., Davila, Y. C., & **Meier, P. C**. (2016). Enhancing the Flipped Classroom Experience with the Aid of Inclusive Design. In *Association for the Advancement of Computing in Education* Vol. 2016 (pp. 1789-1801). Canada: Association for the Advancement of Computing in Education (AACE). Retrieved from https://www.learntechlib.org/p/173190

- The aim of this paper is to discuss the integration of Inclusive Design into Flipped Classroom interventions to cater for a wider range of learners. For this purpose, we reviewed the pedagogical foundations of Flipped Classrooms, the advantages and disadvantages of its implementation, and discuss Inclusive Design enablers

UTS Case example

Developing Inclusive STEM Curriculum (DISC)

Aim

To ***develop, implement, and evaluate targeted initiatives*** to enhance curricula and culture in the Faculty of Science to be inclusive and representative of diverse people, resources, approaches, and knowledges.

Some definitions

Diversity is the presence of a wide range of perspectives and experiences within a group

Equality is the availability of the same pathways for different individuals to take to be successful.

Equity is the availability of various pathways for different individuals to take to be successful which acknowledges the influence of societal privilege and oppression on achievement.

Inclusion is when individuals in a diverse group realize success using equitable pathways.

Adapted from Johnson, K. M. S. (2019) and Mercer-Mapstone, Islam, and Reid (2019)

Can we strive for inclusion when our norms are typically exclusive?

So where do we sit?

- We need to examine why we engage in service teaching.
- Should integrative curriculum structures be developed – science delivered in the context of other disciplines?
- The literature and practical experience suggests that is not being widely done at the moment - and is that because of the drawbacks of integrative curriculum?
- Finally – are we engaging with inclusive or universal design - and does that need to be different for service subjects to other disciplines?

Characterise service teaching

- Across disciplines within faculty
- Across disciplines outside of faculty
- How you answer the following questions may reflect the value you place on service teaching

The survey asks:

Why do we do it?

- $$$$$$$$$$$
- Are EFTSL wars unavoidable?

Does service teaching fall to junior academics (dare I identify females?), low performing research staff, “teaching intensive” staff or casuals?

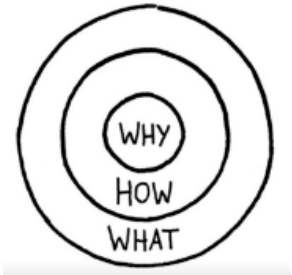
If any of this is true – what does it mean?

Group discussions

- Policy context/institutional support
- Working relationships
- Co-teaching vs service teaching: Integrating context

- Good practice examples

Mystery question: How do students view 'service' teaching as part of their disciplinary experience?



Take homes

- The golden circle – “why” is important
- Interdisciplinary instruction focusing on conceptual frameworks to scaffold knowledge
- Attention to inclusive and universal design principles