UNIVERSIDAD DE DESAROLLO THIRD VIRTUAL MEETING ON TEACHING, LEARNING AND ASSESSMENT IN HIGHER EDUCATION 15 NOVEMBER 2022

Enhancing Teaching Learning & Assessment CAN WE GET IT RIGHT FIRST TIME?

Dai Hounsell
• University of Edinburgh

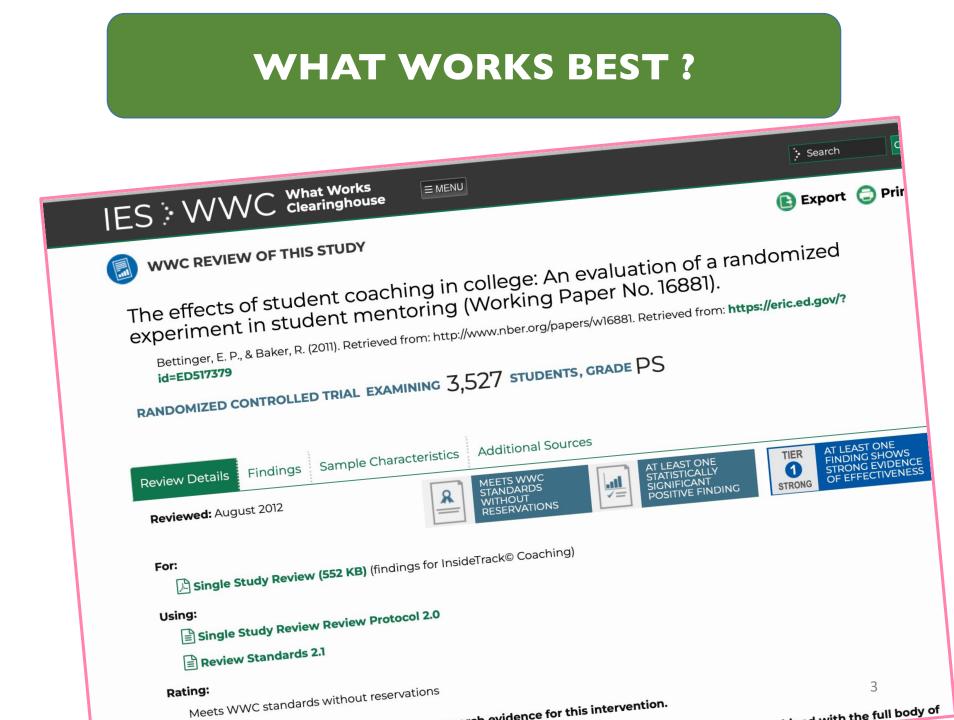
WHAT WORKS BEST ?

Synthesis of "over 800 meta-analyses, including about 250+ million students, 50,000+ studies, about 150,000 effect-sizes, from early childhood through adult education, in the search for what works best". (*Hattie*, 2009)

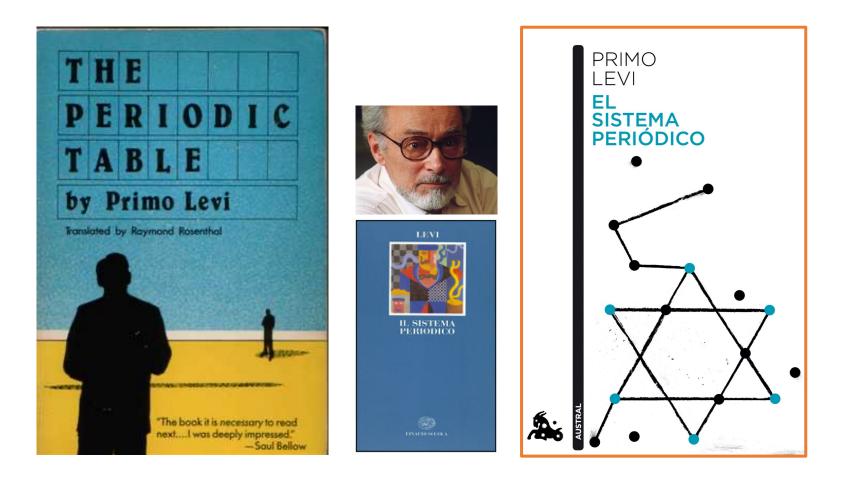
Ran	Ranking of effects relevant to higher education Domain			
1	Student	Infl.		
3 8 9	Teaching Teacher Teaching	Providing formative evaluation to lecturers	d 1.44	
10 12	Teaching Teaching	Reciprocal teaching Feedback	.90 .75 .74	
13 17 18	Teaching Curricula	Spaced vs. Mass Practice Meta-cognitive strategies	.73 .71	
19 20	Teaching Teacher	Creativity Programs Self-verbalisation/Self-questioning Professional development	.69 .65	
21 24	Teaching Teacher Teaching	Problem solving teaching Not Labelling students	.64	
25 29	Teaching Teaching	Study skills	.61 .61 .59	
30 34	Teaching Teaching	Mastery learning Worked examples	.59	
36 37 48	Teaching Teaching	Goals - difficulty Peer tutoring	.57	
19	School Student	Cooperative vs. competitive learning Small group learning Concentration in	.55 .54	
0	Teacher	Concentration/Persistence/ Engagement Quality of Teaching	.49 .48	
			.44	

Hattie's conclusions:

- I. 'Almost everything works'
- 2. 'What works in schools, also works in universities'.



THE PROBLEM OF THE ALMOST-THE-SAME lo casi-igual



"Que conviene desconfiar de lo casiigual, [...] de lo prácticamente idéntico, del poco más o menos, del <<o sea>>, de todos los sucedáneos y de todos los remiendos.

Las diferencias pueden ser pequeñas, perio llevan a consecuencias radicalmente distintas, como el cambio de agujas en el rumbo de un tren.

El oficio del químico consiste en gran parte en defenderse de estas diferencias, en conocerlas de cerca, en prever las consecuencias. Y no sólo el oficio de químico."

Primo Levi. 'Potasio'. *El Sistema Periodico*. Ediciones Peninsula. p. 69 (2021). "One most distrust the almostthe-same [...] the practically identical, the approximate, the oreven, all surrogates and all patchwork.

The differences can be small, but they can lead to radically different consequences, like a railroad's switch points.

The chemist's trade consists in good part in being aware of these differences, knowing them closeup, and foreseeing their effects. And not only the chemist's trade."



Primo Levi. 'Potassium'. *The Periodic Table*. Penguin. (1975). pp. 50-51

THE GREAT DIVERSITY OF UNIVERSITY TEACHING-LEARNING PRACTICES

ESTERHAZY (2019) ON FEEDBACK TO UNIVERSITY STUDENTS "[...] Even small adjustments, such as changing locations or timing of a course activity, might have far-reaching implications for the ways students might engage with the feedback information they receive.

Whether feedback has an impact on student learning, thus, is dependent on the delicate network of relations that characterize our course designs, the wider knowledge domain and the interactions we engage in on a day-to-day basis."

THE GREAT DIVERSITY OF UNIVERSITY TEACHING-LEARNING PRACTICES

"Research into learning increasingly points to the need to understand phenomena in context; to recognise that situations differ, and are specific, and that specific problems need particular answers." (Haggis, 2006, p. 20)

"Teaching takes place within particular departmental and institutional contexts, each with its own particular culture, patterns of practice, regulations and resource constraints.

However clever specific examples of 'good practice' may be, they need to be adapted and bent to the needs of particular contexts if they are to be used at all."

(Bucklow & Clark, 2003, p. 70)

AN EXAMPLE OF ENHANCEMENT interactive engagement & peer learning in large STEM classes

AN EXAMPLE OF ENHANCEMENT interactive engagement



Clicker Question

Which of these External Factors is most important in causing landslides (and reducing shear stress)?

A) High slope angle

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- B) Undercutting
- C) Overloadii
- D) Vegetation
- E) Climat

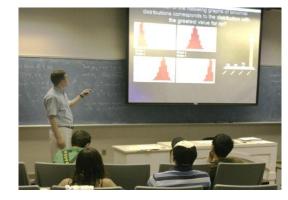






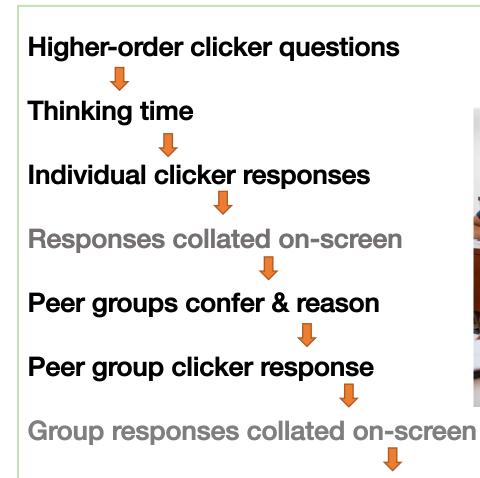












Whole-class teacher-led review





question-setting + clickers creates 'moments of feedback' which can be constructively engaged with



- class-wide responses make visible to the teacher the quality of students' comprehension
 - initially, & then after peer interaction
- peer discussions enable students, through interaction, to surface, question & recalibrate their understanding

AN EXAMPLE OF ENHANCEMENT interactive engagement

"In making their ideas visible, the students enabled others to connect to these ideas, to build on them, to criticise them and to argue for or against them, [...] allowing for the development of multiple perspectives.



The students' reasoning was visible to everyone in the group [...] in their justifications of their own or their peers' claims.

They asked for clarifications, or they addressed concepts that were unclear."

Ludvigsen et al. 2020





 Good evidence of positive impact on students' conceptual understanding, engagement and self-regulation

Freeman et al. 2014; Chien et al., 2016; van Alten et al. 2019; Egelandsdal & Krumsvik, 2020

 Wide adoption in STEM (Science, Technology, Engineering, Maths) subjects

e.g. Stains et al. 2018

- two-fifths of large STEM classes observed across 25 US universities made use of interactive methods with the potential for feedback interchange
- over one-quarter of classes incorporated these student-centred approaches into large portions of class time

WHAT HAVE I LEARNT ABOUT ENHANCEMENT ?
1. the gap to be bridged
2. 'insider' insights
3. learning collaboratively

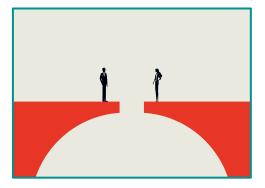


What is the gap between where you are and where you're aiming to be?

... And how could you try to bridge that gap?



Higher-order clicker questions Thinking time Individual clicker responses **Responses collated on-screen** Peer groups confer & reason Peer group clicker response Group responses collated on-screen Whole-class teacher-led review





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WHAT I'VE LEARNT the gap to bridge





mindsets . . . and metamorphoses

the under-recognised need to practise unfamiliar skills



mindsets . . . and metamorphosis

the under-recognised need to practise unfamiliar skills "Innovative assessment thrives most in the context of a positive atmosphere which encourages risk-taking facilitated by trusting relationships between different stakeholders: management, staff and students.

A facilitating factor [was] the teachers' willingness to take risks and the trust they received from colleagues and at the institutional level. Students invariably responded positively . . . they had faith in their teachers."

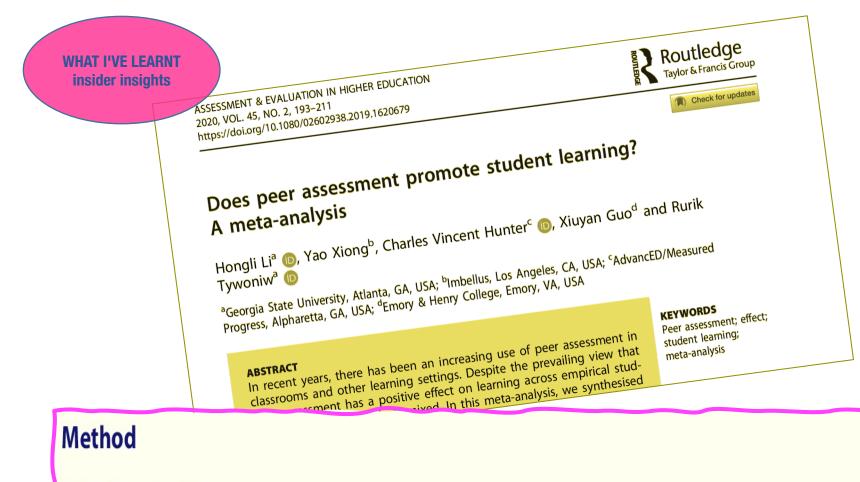
Excellence in University Assessment

DAVID CARLESS

Carless (2015) p. 238

WHAT HAVE I LEARNT ABOUT ENHANCEMENT ?

2. 'insider' insights



Selecting studies

The criteria used to select studies for inclusion in our meta-analysis are as follows. First, eligible studies must have an experimental or quasi-experimental design with a control group and an experimental group. We did not consider any single-group studies. Second, only studies with at

WHAT I'VE LEARNT insider insights

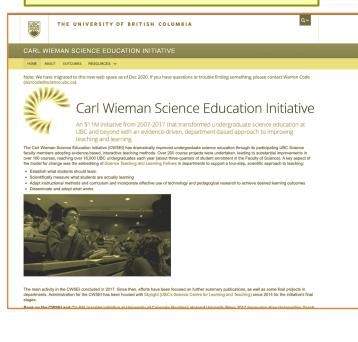
THE VALUE OF GOING BEYOND THE CONVENTIONAL RESEARCH LITERATURE

Finally, there is the issue of generalisation. We have no evidence of to what extent the results of our study are valid for other skills, other disciplines and other types of education.

We studied peer assessment designs in a curriculum in which writing has an important place: history students are expected to write a lot in their future professions. This also means that the results of this study cannot be generalised for other curricula, such as physics or vocational practices.

(van den Berg 2006)

https://cwsei.ubc.ca/home



Appendix ~ CASE EXAMPLES, by subject area

FACULTY OF HEALTH & SOCIAL SCIENCES

es & Public Health

10). Building competency in the novice allied health professional through peer coaching Journal of Allied Health,

(v) contains compacting in the invice and on team procession in a long per containing points of year reading per wave neithin mining any per professional development procession in a long per containing points of year read-coaching can be used to support professional development procession in a long and the sciences such as physiotherapy being on one's own on a placement can be stressful. Through asking questions and engaging with others, peer to be an other science in the science of the science science in the science of the science science in the science of the science science is an other science of the science of the science of the science of the science science science is an other science of the science science is a science of the science o puild confidence as novices journey towards competence.

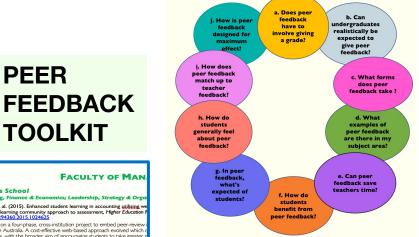
A journey towards sustainable feedback. Assessment & Evaluation in Higher Education 43.2, 1080/02602938 2017 1332154

108002002938.2017.1332154 of nutruing student's skills in self-exatuation, peer feedback was introduced into two first-year units in public britly of Queensland. Experiences showed that while the students were willing to engage in the process and portunity to provide and receive feedback, the quality and extent of the peer feedback field short of staff four authors concluded that a longer-term perspective was called for, with greater emphasis placed on developing feedback that connected students with peers and educators.

N.S.& Segnag, C. (2016) Developing 21st century graduate attributes incorporating novel teaching strategies riculum, European (and of Physiotherapy, 183, pp. 194-199. DOI:10.1080/21679169.2016.1181.205 graup interview with physiotherapy students at Glasgow Caledonian University to discuss an intilative involving

https://peerwise.cs.auckland.ac.nz





Accounting, Finance & Economics; Leadership, Strategy & Org Taylor, S. et al. (2015). Enhanced student learning in accounting utilising w practices: a learning community approach to assessment, Higher Educatio 10.1080/07294360.2015.1024625

TOOLKIT

PEER

Business School

Reports on a four-phase, cross-institution project to embed peer-review classes in Australia. A cost-effective web-based approach evolved which strategies, with the broader aim of encouraging students to take greater significantly improved student ratings for the peer-review process and a See also: Taylor, S. & Ryan, M. (2016). Teaching peer review reflective p Higher Education. Switzerland: Springer. pp. 111-126. DOI 10.1007/978

Malan, M. & Stegmann, N. (2018). Accounting students' experiences of pe African Journal of Accounting Research, 32.2-3, pp. 205-224. DOI: 10.1080/10

Reports on a peer assessment initiative with second-year accounting stu turn steer them towards self-assessment and becoming more self-regula the assignment of a peer and provide them with feedback. The peer cou questionnaire survey revealed that students pecopised the value of peer own learning, at the same time as enhancing their understanding of the

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WHAT I'VE LEARNT insider insights

VIDEOS · PODCASTS · BLOGS · CASE VIGNETTES · WEBINARS



Assessing Presentations in Common Core Courses

CASE EXAMPLES FROM HKU

Where indicated below, the website version of these case examples provides access to supplementary materials in the following forms: (B) = rubric (C) = guidelines

ORAL PRESENTATIONS - individual

China's Modernisation in the East Asian context (CCCH 9006)

Assessment for this course includes a tutorial presentation (30%) on topics assigned by the teacher, while grading of tutorial participation includes fellow-students' questioning of presenters and engagement in ensuing discussions. In their first class, students receive guidance in the form of examples of presentations at different grade levels. (1) Dr Victor Teo, School of Modern Languages and Cultures victorteo@hku.hk

http://commoncore.hku.hk/ccch9006/

Hendro Content State (CCST 9015) Students taking this course are assessed by an individual essay and a 3-minute oral presentation on their design of a new IT device or creative use of an existing gadget or software. PowerPoint can be used but other approaches to presenting are equally welcome. Teachers give feedback to presenters after the tutorial based on rubrics posted on

Blood, beliefs, biology (CCST 9024)

Assessment for this course includes a group presentation (20%) based on a field trip. Working in groups of 8-10, students choose a topic from the list provided and prepare a 10-minute presentation followed by 3-minute O&A Evaluation is by teachers (15%) and student peers (5%) using specially adapted rubrics (8) designed to foster continuous improvement in problem-solving and communication skills. Audience members can get bonus points for their questions. (i) Prof L.C. Chan, Department of Pathology

楊 明 物 炖

chanlc@pathology.hku.hk http://commoncore.hku.hk/ccst9024/

and the Illicit World Economy (CCCH 9027)

In this course, group presentations plus handout (25%) are linked to research essays (35%). Each member of a presenting group is expected to speak (7-8 minute) and to

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Promoting, discussing and celebrating teaching at The University of Edinburgh



Critical thinking skill: Challenges faced by international students in finance degrees

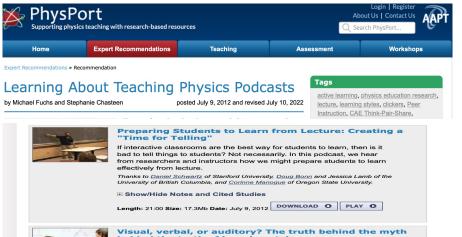


"I know a first when I see one!": Developing transparent marking descriptors with the help of students



THE UNIVERSITY of EDINBURGH

Shaping the future curriculum with students



behind the truth of learning styles.

Are you a visual learner or an auditory learner? I bet you can tell me which you think you are. But does it matter? In this podcast, we discuss the





"With teachers, authentic and enduring learning requires collaboration. When teachers collaborate, they can work together in ways that scaffold and support each other's learning, and in ways that supplement each other's knowledge

There are difficult intellectual and professional challenges that are nearly impossible to accomplish alone but are readily addressed in the company of others."

Shulman, L. (2004). Professional development: learning from experience'. In: Shulman. L. The Wisdom of Practice. San Francisco: Jossey-Bass. p. 515.

https://peerwise.cs.auckland.ac.nz

Welcome to PeerWise

To log in, select your school / institution from the list below



"Peerwise has catalvzed a surge of engagement around my subject. It has provided an outlet for so many different learning approaches: the creative, the critical, the studious, the explainers and the inquisitive. The best rated questions are generally better than what I would get from my academic colleagues; they are related to the syllabus,

tested, refined and, above all, they have explanations. We have seen engagement with PeerWise gives a strong uplift in marks to all grades of student, and helps them develop prioritisation, articulation and the skills of criticism and reflection."

> Prof. Gareth Denyer Professor of Biomedical Education University of Sydney, Australia



"As well as using PeerWise with mv own students in Physics, in my role as Dean of Learning and Teaching I am able to promote effective tools such as PeerWise to take forward the aims of our learning and teaching enhancement strategy. All too often such strategies have

grand visions and wise words that leave academic staff at the coalface wondering "All very well, but what can I actually do with my students to deliver this?" PeerWise represents an effective, easy to use tool that instructors can readily appreciate the educational benefits of using."

> Prof. Simon Bates Professor of Physics University of British Columbia, Canada



"I just wanted to sav thank you for PeerWise! We've just finished using it in a class with 400 very diverse students and the outcome was excellent. The students loved the site and using it vastly improved their understanding of the material covered in class. The only down side was

complaints from other staff members that students were not attending to their work in other subjects because they were 'playing' with PeerWise on their mobile devices. Oh, and now we are getting complaints from students who want to know why we aren't using Peerwise in all of our subjects. Great work!"

> Dr. Pauleen Bennett Associate Professor of Psychology La Trobe University, Australia





Lindsay Hutter

Nothing boosts a students confidence more than answering PeerWise questions correctly 12 Oct via web

@DDurnford Dion Durnford

The more I explore @peerwise, the more I like it, Should be a nice addition to first year bio. 27 Aug via web

@isalsman James Salsman

RT @junecohen: TEDPrize winner 's talk: ted.com/talks/sugata Sugata Mitra // what he's asking for already exists; it's called PeerWise 27 Feb via web



Just earned some more badges on Peerwise #LikeABoss

@Alice Boiish Alice

very amusing. 9 Aug via web

Lucy

@EsherChemistry

10 Apr via web

N

@jayherself

Jav Herself

@lucytwitcher

@CrashCall

Craig MacLean

Love Peerwise, best form of in-course-assessment EVER 25 Nov via web

Reading through my students PeerWise guestions. I

appreciate their efforts to make them not only correct, but

PeerWise: who knew Chemistry revision could be so fun!

Spent AGES tonight on Peerwise creating and answering



Peerwise went down a storm today. Thanks to Kristy Turner for the tip. Once the class heard about leaderboards it went virall 20 Nov via web



Niall Gallagher

@CBS Lecturer The (inadvertent) spaced repetition of similar questions really does help to reinforce understanding; found Peerwise great! 10 May via web



Unbelievable presentation by 4th year medicine student on use of peerwise. Best presentation of the day #gu2013ltc 19 Apr via web



#BMS2035 Some excellent new questions posted on



Francesca Tonini addicted to earning badges on peerwise, #thiscantbegood

#sundavnight #helpline 25 Nov via web

@americanocookie d

vongie Why suddenly I am addicted to PeerWise? O.o 7 Jan via web



RT @simonpbates: Speaking in Faculty of Ed. today on some of the amazing work students have done with #peerwise educ.ubc.ca/james-bond-internet-memes



28 Mar via web

@mamarobertson4 Laura Robertson Snow day so I'm importing qs for our #amstuds taking the

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https://cwsei.ubc.ca

THE UNIVERSITY OF BRITISH COLUMBIA

CARL WIEMAN SCIENCE EDUCATION INITIATIVE

HOME ABOUT OUTCOMES RESOURCES -

Related Efforts

One of the successes of the SEI model is that it has inspired many other similar initi teaching and learning through department-based change.

Parallel initiative at the University of Colorado Boulder

The University of Colorado Science Education Initiative (CU-SEI) www.colorado.edu/sei

The CU-SEI was also directed by Carl Wieman and involved efforts to improve undergraduate science education in the depant Biochemistry, Geological Sciences, Integrative Physiology, Molecular, Cellular & Developmental Biology, and Physics. UBC are efforts to improve science education on university campuses.

PhET phet.colorado.edu

UBC

Fun, interactive, research-based simulations of physical phenomena from the Physics Education Technology project at the Un

Other efforts at UBC

Skylight: Science Centre for Learning and Teaching skylight.science.ubc.ca

Skylight, UBC's Science Centre for Learning and Teaching, is a research- and support-focused unit engaged in advancing the Administration of the CWSEI shifted to Skylight in 2014.

SEI Course Materials System sei.ubc.ca

The Science Education Initiative Course Materials System is a repository for University of British Columbia (UBC) and the Uni materials, as well as notes on the purpose and design of the courses and the use and effectiveness of the materials. The syst by departments participating in the Science Education Initiatives at UBC and CU, and is intended to be an open resource for effectiveness.

CTLT: The Centre for Teaching, Learning and Technology ctlt.ubc.ca

ISoTL: The Institute for the Scholarship of Teaching and Learning isotl.ctlt.ubc.ca

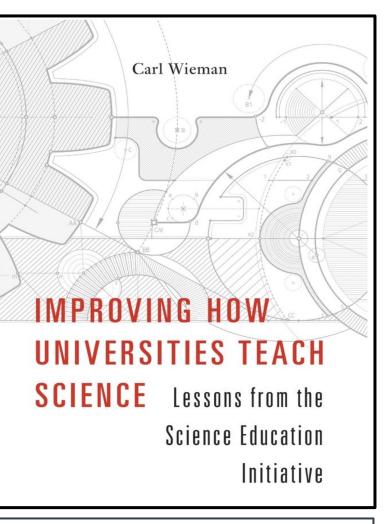
Initiatives at other institutions inspired by the SEI

The SEI Handbook includes summaries of similar initiatives that have the goal of improving teaching and learning by hiring dis specialists. Included are:

- Brown University's AAU Undergraduate STEM Education Initiative Project: Changing the Culture of Introductory Science
- Cornell University's Active Learning Initiative
- Imperial College London's Learning and Teaching Strategy
- The University of Hawai'i's Geoscience Course Transformation Project
- The University of Kansas' Course Transformation Initiative

Other groups or initiatives of interest

- Colorado Physics Education Technology (PhET) Interactive Simulations
- TRansforming Education, Stimulating Teaching and Learning Excellence (TRESTLE): A multi-institution, NSF-funded proje
- expertise model at other research universities to explore use of the model in several contexts. Several of the case studies



Harvard University Press 2017

https://www.hup.harvard.edu/catalog.php?isbn=9 780674972070

https://www.teaching-matters-blog.ed.ac.uk

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5 Things						🕥 🖸 in

Category: Student engagement



Community building with the IMPS Sports Day



Welcome to the Sept-Oct Hot Topic: Student Partnership Agreement 2022



A quiet, unnoticed form of gentle solidarity



4TH OCTOBER 2022

APEX6: Student-led

Eve Was Framed Helena Kennedy

23RD AUGUST 2022

Shelf Indulgence: A book club project bringing students and professionals together



Shaping the future curriculum with students

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Critical thinking skill: Challenges faced by international students in finance degrees



 "I know a first when I see y one!": Developing
 nts in transparent marking descriptors with the help of students

Enhancing teaching learning & assessment

SO ... CAN WE GET IT RIGHT FIRST TIME?

REFERENCES, I

Bucklow, C. & Clark, P. (2003). A new approach to professionalising teaching and accrediting training. In Blackwell, R. and Blackmore, P. (eds.). *Towards Strategic Staff Development in Higher Education* London: SRHE. pp. 67-79).

Carless, D. (2015). *Excellence in University Assessment. Learning from award-winning practice.* London: Routledge.

Chien, Y.-T., Chang, Y.-H. & Chang, C.Y. (2016). Do we click in the right way? A meta-analytic review of clicker-integrated instruction. *Educational Research Review* 17, pp. 1-18. http://dx.doi.org/10.1016/j.edurev.2015.10.003

Egelandsdal, K. & Krumsvik, R.J. (2020). Clicker interventions: promoting student activity and feedback at university lectures. In: Tatnall A., eds. *Encyclopedia of Education and Information Technologies*. Cham: Springer. <u>https://doi.org/10.1007/978-3-030-10576-1_189</u>

Esterhazy, R. (2019). Re-conceptualizing feedback through a sociocultural lens. In: Henderson, M., et al. (eds) *The Impact of Feedback in Higher Education*. Cham: Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-030-25112-3_5

Freeman, S., et al. (2014). Active learning increases student performance in science, engineering, and mathematics. *Proceedings of the National Academy of Sciences*, 111, pp. 8410–8415. https://doi.org/10.1073/pnas.1319030111

Haggis, T. (2006) Pedagogies for diversity: retaining critical challenge amidst fears of 'dumbing down', Studies in Higher Education, 31:5, 521-535. <u>https://doi.org/10.1080/03075070600922709</u>

Hattie, J. (2009). *Visible Learning: a synthesis of meta-analyses relating to achievement*. London: Routledge. ISBN13: 978-0-415-47617-1

REFERENCES, 2

Hounsell, D. (2021). Feedback in postgraduate online learning: perspectives and practices. In: Fawns, T., Aitken, G. & Jones, D. (eds). *Beyond Technology: Online Postgraduate Education in a Postdigital World*. Cham: Springer. pp. 39-62. <u>https://link.springer.com/book/10.1007/978-3-030-77673-2#toc</u>

Hounsell, D. (forthcoming). Feedback and interactive engagement in large undergraduate classes.

Hounsell, D. and Zou, T. (2017). Surfacing and sharing advances in assessment: a communities of practice approach. In: Carless, C., et al. (eds). *Scaling Up Assessment for Learning in Higher Education*. Singapore: Springer. pp. 33-48 ISBN 978 981 10 3043 7

Ludvigsen, K., Krumsvik, R.J. & Breivik, J. (2020). Behind the scenes: unpacking student discussion and critical reflection in lectures. *British Journal of Educational Technology* 51.6, pp. 2478-2494. <u>https://doi.org/10.1111/bjet.12922</u>

Stains, M. et al. (2018). Anatomy of STEM teaching in North American universities. *Science*, 359.6383, pp. 1468-1470. <u>https://www.science.org/doi/10.1126/science.aap8892</u>

van Alten, D.C.D., Phielix, C., Janssen, J. & Kester, L. (2019). Effects of flipping the classroom on learning outcomes and satisfaction: A meta-analysis. *Educational Research Review* 28, 100281. https://doi.org/10.1016/j.edurev.2019.05.003

van den Berg, I., Admiraal, W. & Pilot, A. (2006). Design principles and outcomes of peer assessment in higher education, *Studies in Higher Education*, 31.3, pp. 341-356. https://doi.org/10.1080/03075070600680836