A Job Application as the Capstone for Work Integrated Learning

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- Honorary Lecturer, Computer Science ANU
- Professional Education Governance committee member, Past President, Honorary Life Member & Fellow of the Australian Computer Society
- Fellow of Advance HE (UK)
- Blogs as the Higher Education Whisperer

TechLauncher: Group Computing Project

- Developed by Dr Shane Flit, now run by Dr Charles Gretton
- Combines five ANU undergraduate & postgraduate project courses
- Students work on a *real* project, in a team for a *real* client, such as CEA.

HMAS Perth with a Phased Array Radar from CEA Technologies in Canberra

Source: https://www.flickr.com/photos/133059881@N02/19756029272

See: R. Awasthy, S. Flint, and R. Sankaranarayana, “Lifting the constraints—closing the skills gap with authentic student projects,” in 2017 IEEE Global Engineering Education Conference (EDUCON). IEEE, 2017, pp. 955–960.

Learning to Reflect

Reflection is a valuable skill, but …

1. STEM students have difficulty with this.
2. English speakers of other languages (ESOL) have more challenges.
3. Group project students have difficulty switching to a solitary reporting activity.

Approach to Teaching Reflection

- **Progressive**: series of exercises with time to reflect, and benefit from feedback,
- **Collective**: students benefit as much from *providing* feedback, as receiving it,
- **Scholarly**: explain why and how a reflective exercise is useful,
- **Limited**: don't claim a portfolio will be valuable career tool.

My Last Lecture

“I don't like giving lectures to groups of eighty or so students. It is very hard to get any feedback. In some lecture theatres difficult to see the students and in some of the old steeply tiered ones I get a sense of vertigo: looking up from what feels like the bottom of a well.”

From: My Last Lecture, Wednesday, August 20, 2008, https://blog.tomw.net.au/2008/08/my-last-lecture.html

Mobile ready, campus compatible

Design courses like flat-pack buildings:
- Interchangeable components on a firm base

First design for online delivery to mobile devices,

Then add campus based activities

ANU Marie Reay Teaching Centre

Cross-section diagram by BVN, 2018

Blended Learning in Chunks

"The term 'blended learning' usually refers to a mix of conventional face-to-face elements combined with on-line elements. However, this is at too general a level for in-depth analysis of the learning design, while the term 'blend' perhaps suggests too homogeneous a mix: in practice, the mix is more 'lumpy', more a chunky fruit salad than a blended smoothie. At one extreme it is becoming routine for campus-based virtual learning environments (VLEs) to be used to provide additional notes and materials supporting conventional lectures"

From: J. Fleck, "Blended learning and learning communities: opportunities and challenges," Journal of Management Development, vol. 31, no. 4, pp. 398–411, 2012.

Different Rooms for Different Pedagogy

Tiered Room in Sciences Teaching Building

Temporary flat floor classroom, Barry Drive

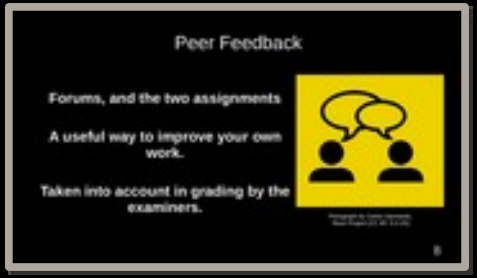
Wall screens & tables on wheels, Marie Reay Teaching Centre

Learning Design Parallels Room Design

Align Assessment with Leaning

Distance education + face-to-face workshops = Blended Learning in *Chunks* (Fleck, 2012)

Use of a Learning Management System



Introductory Video

J. Fleck, "Blended learning and learning communities: opportunities and challenges," Journal of Management Development, vol. 31, no. 4, pp. 398–411, 2012.

Incorporating Co & Extra Curricular Material

Capstone task for student was to write a job application

Material from the ANU Careers Guide was used

Workshop exercises were designed & delivered by Tempe Archer, ANU Careers Consultant

Students encouraged to participate in the ANU Student Experience.

ANU Careers Guide, Australian National University, 2020. https://www.anu.edu.au/files/resource/ANU%20Careers%20Guide%20-Final%20for%20print%20-PDF%20for%20website_0.pdf

Results from 2019 Classroom Version

- Run with 80 masters of computing students in Semester 1 & 245 masters and undergraduates in Semester 2, 2019
- Students tended to give high performing students *higher* grades than instructors, and lower performing students *lower* grades
- Students peer assessed in *same ranking* as instructors
- Grades were close to those for the previous year, using lectures

No significant difference effect? (Nguyen, 2015)

T. Nguyen, “The effectiveness of online learning: Beyond no significant difference and future horizons,” MERLOT Journal of Online Learning and Teaching, vol. 11, no. 2, pp. 309–319, 2015.

2020 Flip to Online Learning

2019: Blended delivery: Tasks set online, F2F workshops.

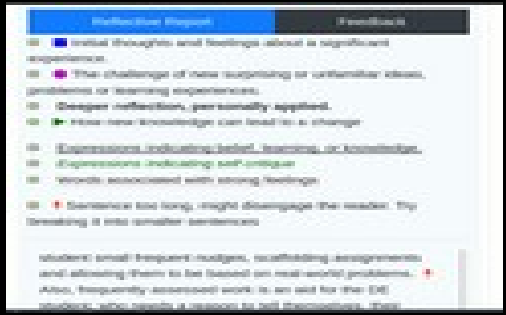
2020/21: Online delivery due to COVID-19 emergency: workshops via Zoom.

2022: MidFlex Minimal Hybrid Format, students & staff online & in classroom.

Beatty, B. J. (2007). Hybrid classes with flexible participation options–If you build it, how will they come. 2007 Annual Proceedings-Anaheim: Volume, 15. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.903.8934&rep=rep1&type=pdf#page=24

Possible Improvements

- Reduce the number of forum posts to reduce confusion
- Change Marking Scheme to Further Encourage Systematic Student Work
- Use ANU co-curricular workshops, in place of custom ones
- Supplement tutors with writing analysis tools



UTS AcaWriter Tool (Aileen, 2019)

Aileen Shibani Michael Xavier, A. (2019). Augmenting pedagogic writing practice with contextualizable learning analytics (Doctoral dissertation). http://hdl.handle.net/10453/136846

Conclusion

Replacing lectures with online exercises, group workshops, and peer-assessed progressive tasks is viable.

Replacing F2F workshops with video conferences is viable. Hybrid mode with some students in classroom, & some online, increases staff workload, but is feasible.

There is no need to design, & administer separate F2F & online versions of courses.

This reflects a social constructionist approach to scaffolded peer learning (Lindley, 2007).

A longitudinal study of this approach would be of value.

D. Lindley, “Computer professional education using mentored and collaborative online learning,” in SEARCC 2007, Proceedings of the South East Asia Regional Computer Conference, 2007, pp. 18–19.

Questions & More Information

Paper on the blended design:

Worthington, T. (2019, December). Blend and Flip for Teaching Communication Skills to Final Year International Computer Science Students. In 2019 IEEE International Conference on Engineering, Technology and Education (TALE) (pp. 1-5). IEEE. https://doi.org/10.1109/TALE48000.2019.9225921

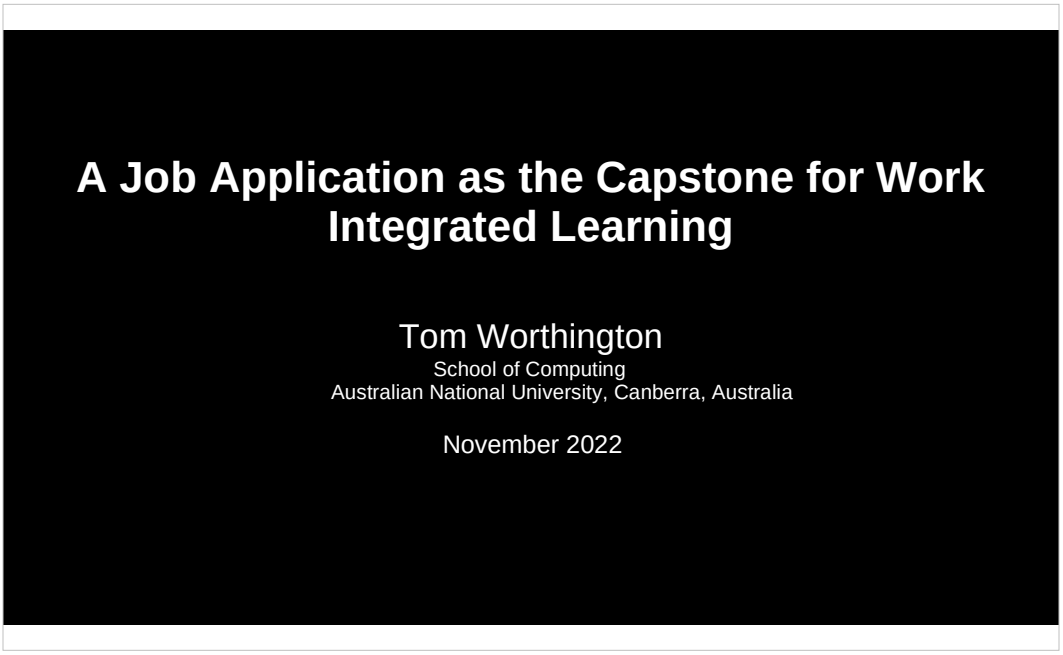
COVID-19 Experience:

Cochrane, T., Narayan, V., Aiello, S., Birt, J., Cowie, N., Cowling, M., ... & Worthington, T. (2021, November). Back to the Future Post Pandemic Socially Constructed Blended Synchronous Learning-Vignettes from the Mobile Learning SIG. In ASCILITE 2021. ASCILITE.

TechLauncher:
https://cs.anu.edu.au/TechLauncher/current_students/

Learning to Reflect Module for TechLauncher, Blog posts 2018 to 2022, with drafts, & commentary:
https://www.tomw.net.au/technology/education/learning_to_reflect/

Tom Worthington, ANU Research School of Computer Science:
tom.worthington@anu.edu.au



A Job Application as the Capstone for Work Integrated Learning, by Tom Worthington.

In 2008 I ended my last computer science lecture for the year by announcing it would be my last lecture, ever. Having become disillusioned with the lecture format, and a lack of suitable alternative teaching spaces, I moved my teaching online. Ten years later a new flexible teaching building became available (built from prefabricated wooden panels, like a giant Ikea bookcase). This is an account of going back to the classroom, to apply a blend of online and classroom teaching in the new building.

The task was to teach international graduate computing students how to write a job application, and in the process, reflect on their learning. These students were completing a work integrated learning (WIL) capstone, where they had worked in teams for a real client, on a real project. Rather than a conventional reflective e-portfolio, which has little relevance, the students undertake a portfolio in the form of an application for a real job, application for a grant to set up a company, or to fund a research degree. This teaching is conducted jointly with the ANU Careers unit, bringing together the teaching and professional arms of the Australian National University, to help students about to graduate and take their next step on a career in business, industry, or academia.

This is a first-person account, of how to create new interactive ways of learning, and allow each student to choose the blend of online and classroom learning to suit their needs. This approach starts with online course design and then adds face-to-face workshops after each online component (flipped classroom). Tom will discuss how this implements a social constructionist approach with scaffolded peer learning.

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About the Speaker: Tom Worthington is an independent computer professional, educational designer and an Honorary Senior Lecturer in the School of Computing at the Australian National University.

A Certified Professional member of the Australian Computer Society, in 2015 Tom received a national gold Digital Disruptors Award for "ICT Education" and in 2010 was Canberra ICT Educator of the Year. Tom previously worked on IT policy for the Australian Government, and in 1999 he was elected a Fellow of the Australian Computer Society for his contribution to the development of public Internet policy. He is a Past President, Honorary Life Member, Certified Professional and a Certified Computer Professional of the society as well as a member of the Institute of Electrical and Electronics Engineers, and Fellow of Advance HE (UK)..

Tom has a Masters in Education (specializing in Distance Education) from Athabasca University, a Graduate Certificate in Higher Education from the Australian National University and a Certificate IV in Training and Assessment from the Canberra Institute of Technology. He blogs as the HigherEducationWhisperer.com.

While an Honorary Lecturer in Computer Science at the Australian National University, a member of the Blockchain Technical Committee and the Professional Education Governance Committee of the Australian Computer Society, his views here do not necessarily reflect those of either organization.

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TechLauncher is an Australian National University computer science program developed by Shane Flit, and now run by Dr Charles Gretton. It combines students from several undergraduate and postgraduate computer science project management courses, to work on real projects for a real client (Awasthy, Flint, & Sankaranarayana, 2017). As an example, several teams of students have worked on testing phased array radar for the Australian military.

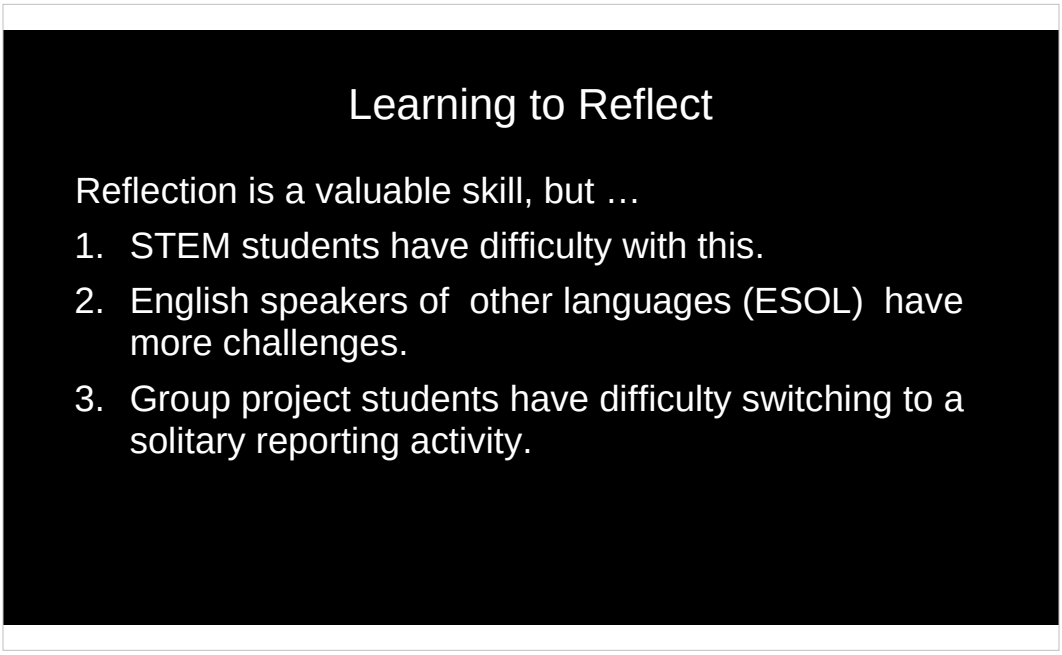
After working as a team, the students last task for assessment is to prepare an e-portfolio and reflect on their learning. Student found this a very abstract task. As this was one of the last tasks to complete before graduating, it was changed to have the student apply for a job, a PhD program, a grant to set up a company, or whatever else them may be planning to do next. The student still has to document what they have done, what they have learned, and how they learned it, but in a practical form.

All of the students at the Australian National University have to opportunity to make an appointment for a personal consultation with the Careers unit, to help with job finding Online tools are also provided for students to prepare a resume, practice responding to selection criteria, and preparing application letters. However, students are reluctant to avail themselves of these services while busy studying. To overcome this reluctance, the process of preparing an application has been integrated into their capstone course, as their last assessed task. Tempe Archer and staff of the ANU Careers unit teach job finding techniques, with assessment and support of School of Computing staff.

References

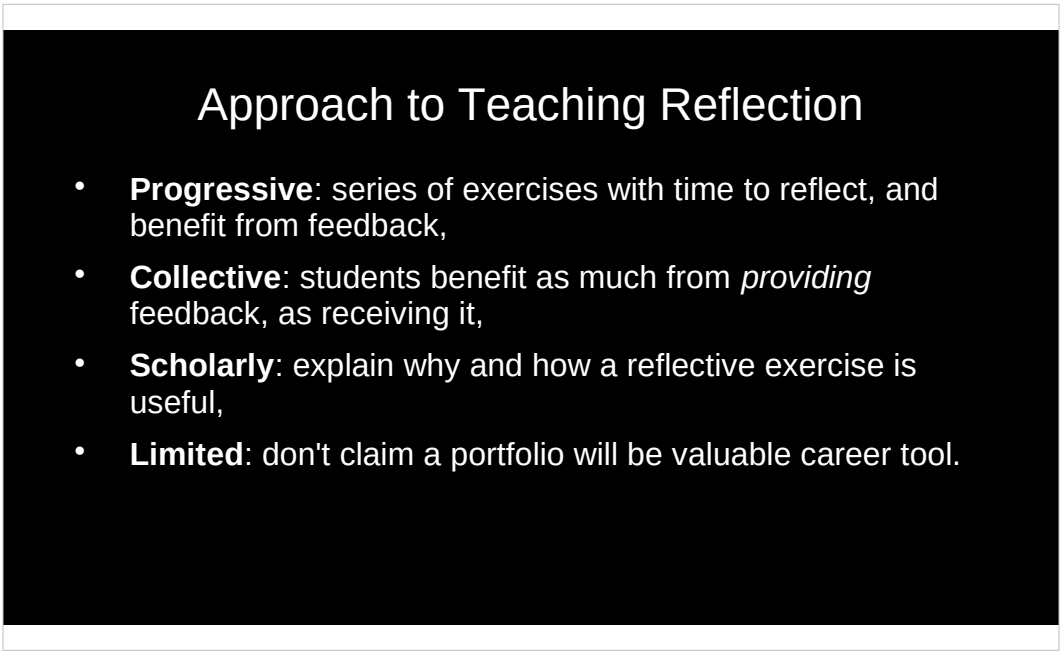
Work Portfolio Package (WPP), TechLauncher, ANU, 2019
https://cs.anu.edu.au/TechLauncher/current_students/evaluation/work_portfolio_package/

R. Awasthy, S. Flint, and R. Sankaranarayana, "Lifting the constraints—closing the skills gap with authentic student projects," in 2017 IEEE Global Engineering Education Conference (EDUCON). IEEE, 2017, pp. 955–960.



Towards the end of their degree, computing students at the ANU may undertake a practical project, either as part of a team, or an individual internship [2]. The last assessment task for the practical project is a written exercise to reflect on learning. Reflection is a useful aid to learning and a valuable skill for a professional who is required to undertake lifelong learning. However, computing students have difficulty with this.

International students who are undertaking their studies in a language which is not their first have additional difficulties]. ESOL (English speakers of other languages) students have many challenges with technical writing [4]. Computing and engineering students and others in STEM disciplines undertake courses on how to carry out analysis of problems and present evidence. However, they are rarely asked to examine themselves as a subject. The emphasis is on the use of objective language, with the author removed from the work. In addition, students undertaking group projects, or a workplace internship, are working with others on a collectively set goal. It is difficult at the end of this collective work to switch to a solitary reporting activity.



Possible ways to help the students would be:

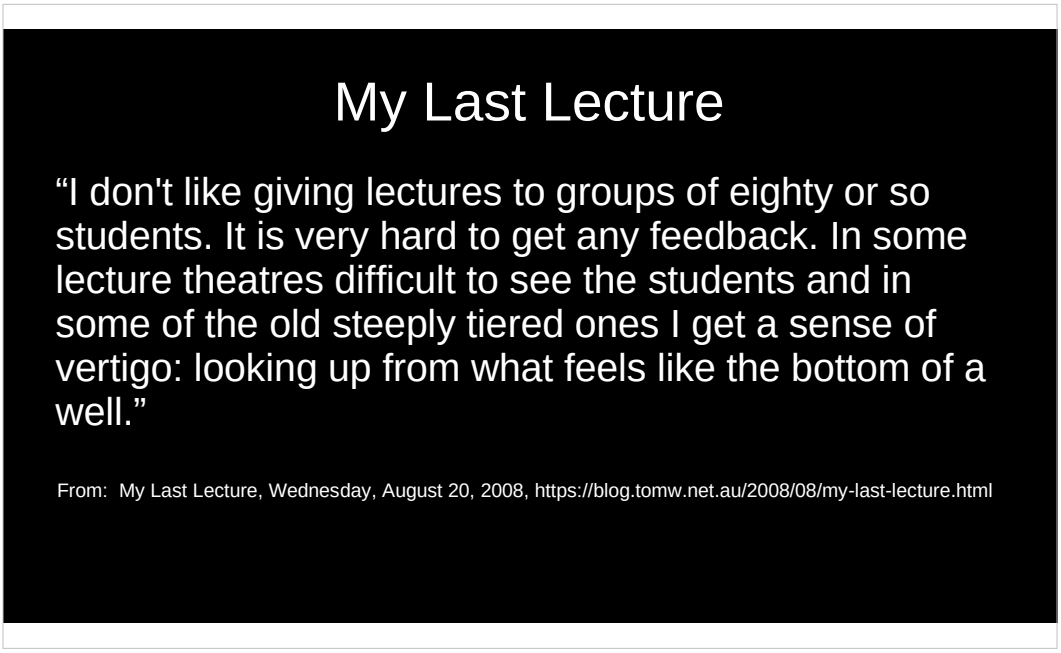
• Progressive: Rather than something required at the end of a course, break the preparation up into a series of exercises. In this way, students can be provided with time to reflect, and benefit from formative feedback on their work. However, for the student to work consistently, there has to be an incentive for doing the exercises on time, by making this a condition of course completion, or each a part of the assessment scheme, or both.

An example of what will not work is to ask the student to complete a reflective journal, but not provide feedback or assessment until the end of the course.

• Collective: Students will benefit from peer feedback on their reflections. The student benefits as much from providing feedback, as receiving it. However, students will need assistance in how to provide feedback if this is something they have not had to do before. Also, an incentive, such as making it a requirement, or assessing the feedback, is required.

• Scholarly: Students will benefit from learning a little of why and how a reflective exercise is useful to them. While not attempting to turn every student into a teacher, it would be useful for them to learn a little of the theory behind the reflective exercise. Some of the skills interns learn and report via their portfolio are in the area of Skill management, specifically “learning and development”, as defined in the Skills Framework for the Information Age (SFIA) [8]. It would be useful to have this listed in the learning objectives for the course, and then to point out to students this is a skill formally recognized internationally by the computing profession.

• Limited: The value of a reflective portfolio should not be overstated. Claiming the portfolio will be valuable career tool is not likely to be believed by the student, and will not motivate them. Students will have undertaken years of disposable assessment tasks which they complete, and then discard, before moving on to the next. The portfolio exercises can be structured so each builds on the last, but even so, it is too much of a leap of faith to believe any of this will be of use after the end of the course. MacKrell, Mhaisuria, and McDonald [9] investigated the gaps between what a university teaches and what is required by industry. Perhaps identifying these gaps could be an explicit goal of the portfolio exercise for each student. Learning what they have yet to learn might be the most useful outcome of the exercise.



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After an absence of ten years, I returned to the classroom 16 September 2019. But this was not a lecture theater, and not for a lecture. It was a flipped workshop, in a new purpose built flat floor classroom of the Marie Reay Teaching Centre .

See: *How to Blend and Flip a Course for a Flatpack Classroom*, Tuesday, March 12, 2019 https://blog.highereducationwhisperer.com/2019/03/how-to-blend-and-flip-course-for.html

Mobile ready, campus compatible

Design courses like flat-pack buildings:
- Interchangeable components on a firm base

First design for online delivery to mobile devices,

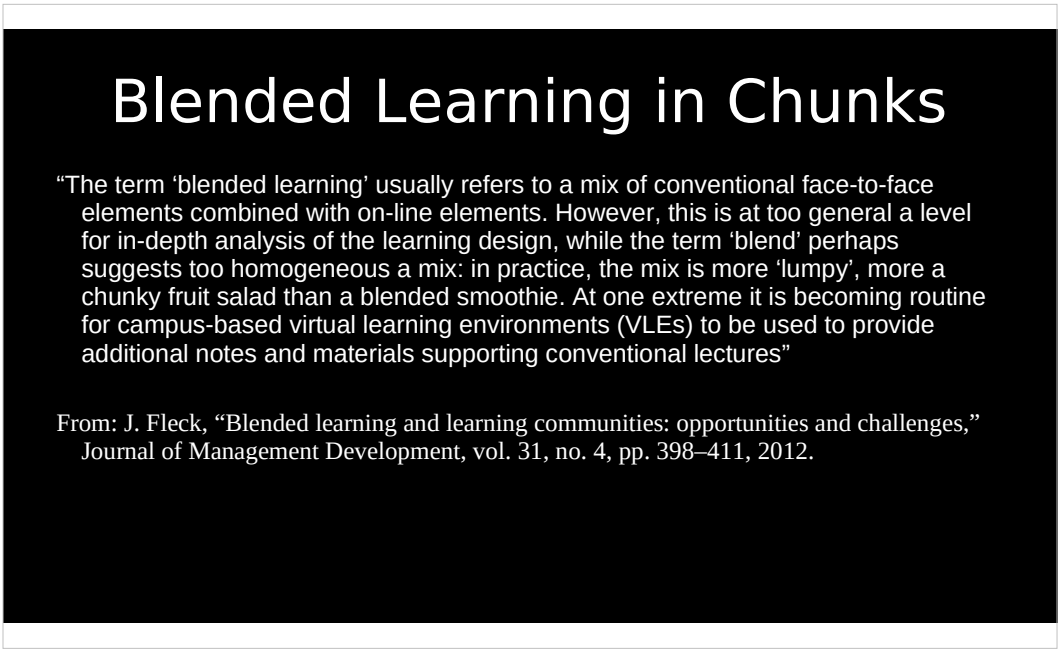
Then add campus based activities

ANU Marie Reay Teaching Centre
Cross-section diagram by BVN, 2018

Design your course like the ANU Marie Reay Teaching Centre: By lead architect Ninotschka Titchkosky of BVN, and constructed by Lendlease, the center is made of pre-cut engineered wood beams and panels, assembled on a concrete base. The building was assembled like a giant piece of flat-pack furniture, and is fitted out with furniture on wheels. This allows rapid assembly, and reconfiguration. I suggest this is a good metaphor for course design: use a solid base and then design in flexibility:

First design your course for online delivery. Use course software, with a responsive web interface, such as Moodle. This will then work on a mobile device, a conventional computer, or even on paper.

Add campus based activities for students, where appropriate. Keep the campus activities flexible. This is flipped, blended learning. It helps to have a purpose designed building, like the Marie Reay Teaching Centre opened March 2019, by Architects BVN. The Centre has only flat floor classrooms, for 30, 60, or 120 students. The flexibility here is provided by retractable walls, furniture on wheels, and electronic screens on multiple walls.



Learning design takes time. Design of the reflective learning module started in November 2018. At that time completion of new flat-floor classrooms was not certain in time for February 2019 commencement. So a conservative approach to blended course design was used, with blended learning chunks.

The design for the reflective module is a distance education course, with face-to-face workshops inserted, to make it blended. The Moodle Learning Management System was used (LMS) for delivering course notes to the students (and tutors), videos, and podcasts. Announcements to all students and messages to individuals is via the LMS. Smaller items of assessment are provided by the quiz and forum modules of Moodle. The Moodle workshop module is used for large assignments.

The student is provided with just two packages, both of two weeks duration. Each segment provides discussion questions, one quiz, notes, suggested readings, plus instructions for an assignment. This is laid out in an e-book, like the chapter of a conventional textbook, and the student can run through it in the order presented, over the two weeks. However, the LMS does not impose any timing, ordering, or sequencing on the student: they can study the material in any order at any time in the two weeks.

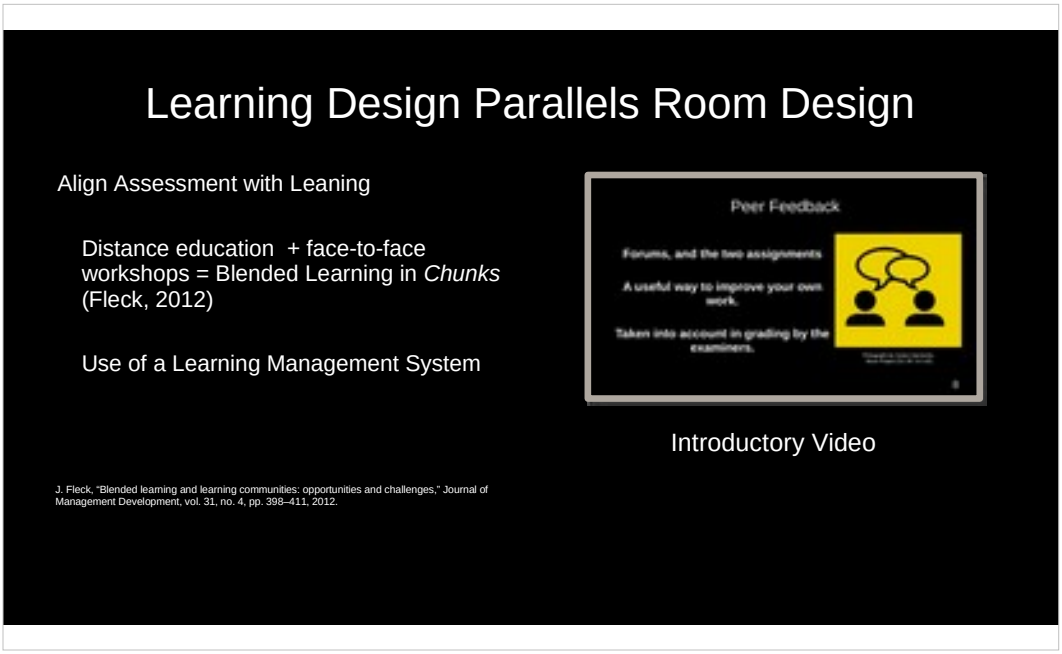
The use of large online chunks contrasts with tightly scripted learning modules. The tightly scripted approach gives the student a screen-full of text, and a video, then an auto- mated quiz, before moving to the next screen. This requires careful design and testing, much like a computer program, if it is not to frustrate students. Also, this tightly scripted approach requires a responsive and reliable computing platform. In contrast, the chunky approach can tolerate errors in the course design and can be used offline.

The ANU campus has a previous generation of flexible learning space, in the Sciences Teaching Building, designed by Australian architects Lyons and opened in 2014. This accommodates one hundred and fifty students, seated at tables of five. The tables are fixed to the floor, on wide shallow tiers. This allows for short presentations, with all students focused on a speaker at the front of the room, and then group discussion around each table. However, the room has the disadvantages of both formats: with the low seating density of a flat floor classroom, and the fixed format of a tiered lecture theatre.

Two new teaching buildings opened at the Kambri precinct of the ANU campus in February 2019 by Australian architects BVN, with each designed for a different pedagogy. The ANU Cultural Center building has a few large auditoriums, with fixed high density tiered lecture theater seating. This is optimized for conventional lectures.

In contrast the ANU Marie Reay Teaching Centre, has smaller rooms, with lower ceilings, movable chairs, and wheeled tables. The seating density is much lower than the cultural center, and with the flat floor it is harder for a student, when seated, to see a presenter on the other side of the room. However, these rooms are intended for interactive group work by students, with formal presentations expected to be kept short, or replaced entirely by online ”flipped” content [10]. By having two buildings, each optimized for a specific format, seating capacity can be maintained, with rooms better suited to each a teaching approach.

The room depicted has electronic screens on the side walls. A desk can be positioned below each screen. With six students per desk and two rows of three tables, the room can accommodate thirty-six students. As the cabling is in the wall, the screens cannot be moved, but the tables can be rearranged, as required.



The course design used here parallels the approach taken for the design of the rooms: for flexibility, but with efficiency.

A. Aligning Assessment with Leaning

Top-down development implies that after the learning objectives are set, the assessment tasks are next defined. However, the course had been run previously with a capstone assessment task. Rather than make too many changes, the capstone was retained, and new small supplementary tasks added leading up to it.

The solution was to halve the marks allocated to the final assessment task and then distribute these to small preparatory exercises. The small exercises are automatically marked multiple choice quizzes, and peer-assessed short written tasks. Retaining the tutor assessed final task provided a level of reassurance for staff who were skeptical as to the reliability of automated and peer assessment.

B. Blended Learning in Chunks

At design time completion of new flat-floor classrooms was not certain, so a conservative approach to blended course design was used, with *chunks:* a distance education course, with face-to-face workshops inserted, to make it blended.

The student is provided with just two packages, both of two weeks duration. Each segment provides discussion questions, videos, one quiz, notes, suggested readings, plus instructions for an assignment. This contrasts with tightly scripted learning modules. The chunky approach can tolerate errors in the course design and can be used offline.

D. Use of a Learning Management System

The Moodle Learning Management System was used for delivery of learning materials, communication from instructor to the class, to individual students and for assessment. A reading budget was set to ensure students were not asked to read too much. The course materials include notes in the form of an e-book, and videos with computer generated speech. These materials have been made freely available online, under a Creative Commons Licence.

Incorporating Co & Extra Curricular Material

Capstone task for student was to write a job application

Material from the ANU Careers Guide was used

Workshop exercises were designed & delivered by Tempe Archer, ANU Careers Consultant

Students encouraged to participate in the ANU Student Experience.

ANU Careers Guide, Australian National University, 2020. https://www.anu.edu.au/files/resource/ANU%20Careers%20Guide%20-Final%20for%20print%20-PDF%20for%20website_0.pdf

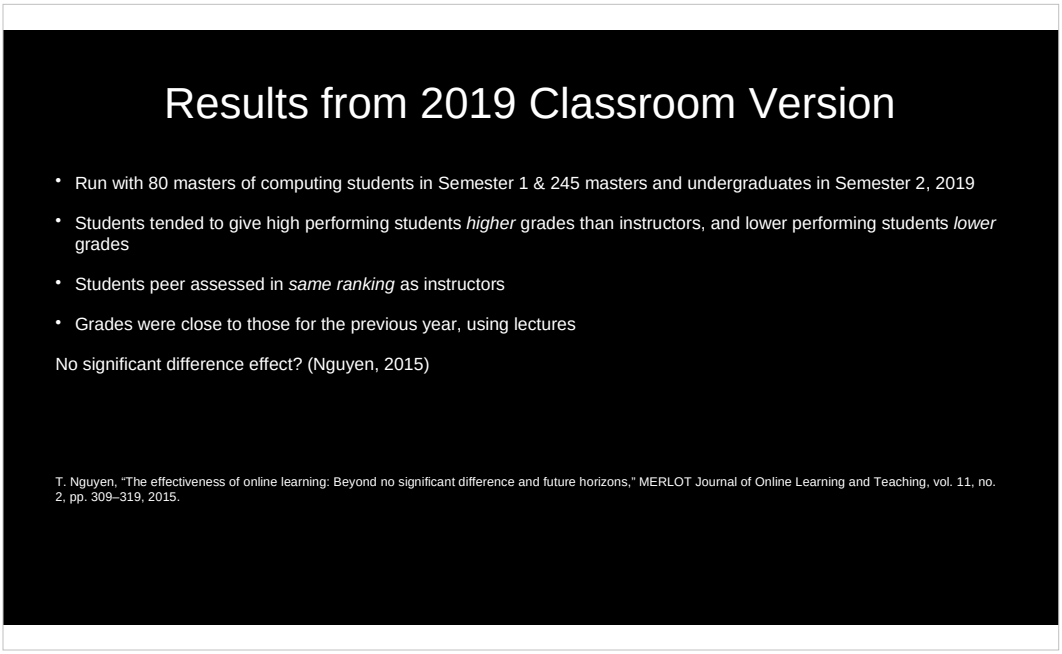
As well as materials on preparing a job application from academia, industry and government, material from ANU Careers was also used, particularly the ANU Careers Guide (2018).

The workshops were all designed with a generic format, where students review what was done online and prepare for the next assignment. However, ANU Careers offered customized versions of their workshops for students. These were designed and delivered by Tempe Archer, ANU Careers Consultant.

Students were also encouraged to identify what additional training they needed and to get that through ANU Student Experience, or elsewhere.

Reference

ANU Careers Guide: A practical guide to planning your career and maximising your employability, Version 7, ANU Careers (2018). URL http://www.anu.edu.au/files/resource/DSA173813%20Careers%20Guide%20v7%20WEB.pdf



The learning module was run with 80 masters of computing students in early 2019. Overall, the student's peer assessment resulting in the same ranking of students as instructor assessment. However, students tended to give high performing students higher grades than instructors, and lower performing students lower grades.

Results were close to the overall results for the previous year's cohort of students, using lectures. However, it is possible that, as with other studies of conventional, versus technology-assisted learning, the "no significant difference" effect is in play (Nguyen, 2015).

Reference

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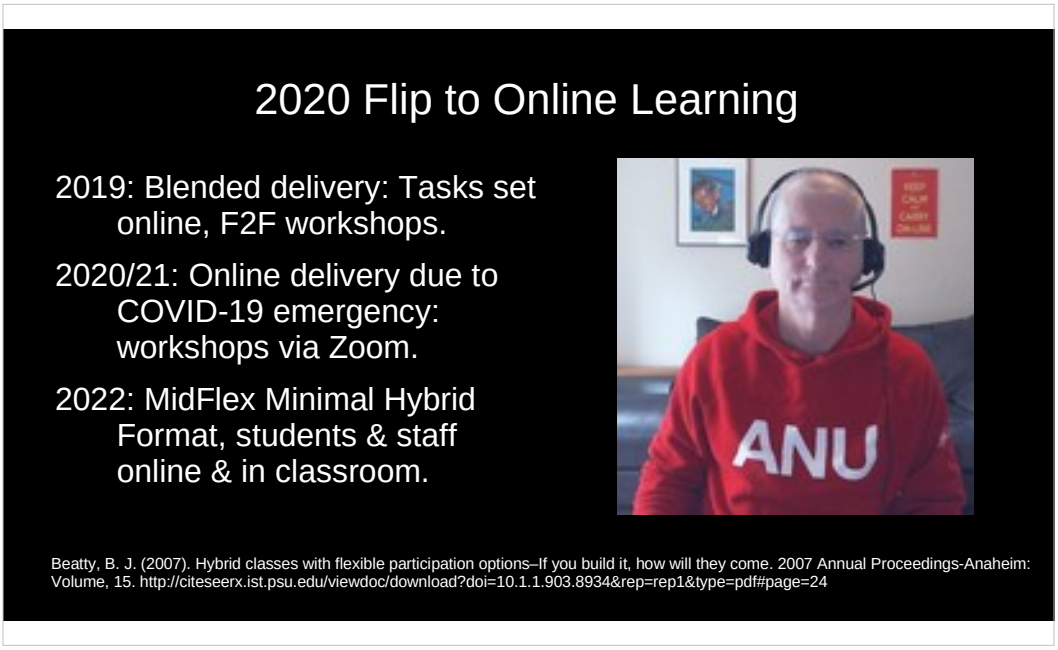

The "Learning to Reflect" module for ANU TechLauncher program, was developed in late 2018 and first run in semester 1, February 2019. It was designed for blended delivery, with the option of easy conversion to full online delivery in an emergency. That option was needed for 2020, and 2021 due to the COVID-19 global pandemic. For 2022 delivery changed to a hybrid format, with some students in a face to face classroom on campus, and others linked online. This was accomplished using a *MidFlex Minimal Hybrid Format*, which requires only limited equipment to link groups of students in the classroom to groups which are online. In contrast to the HyFlex approach (Beatty, 2007).

In addition to Tempe Archer, Careers Consultant, other staff from ANU Careers, and ANU computing staff, prominent alumni, who hire staff for the computer industry were invited to speak and answer student questions. It was found that the hybrid format not only allowed students to be on or off campus, but the teaching staff, and celebrity guests.

Reference

Beatty, B. J. (2007). Hybrid classes with flexible participation options–If you build it, how will they come. 2007 Annual Proceedings-Anaheim: Volume, 15. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.903.8934&rep=rep1&type=pdf#page=24

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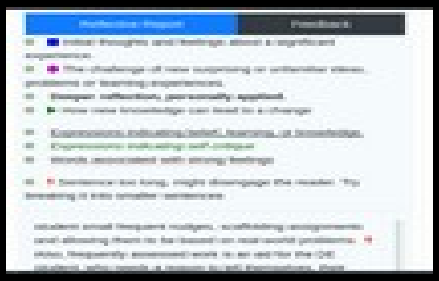

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A. Reduce the number of forum posts

- One question per forum: One should be sufficient to keep students engaged.
- Reduce posting rate: Approximately one-quarter of students left it until the just before the deadline to make all their forum posts. The forum could be set to allow only one post per day, requiring them to spread out their posts.
- Use tutorial cohorts: Having around 100 students in one forum resulted in an excessive number of postings for students to read. Dividing students into groups of about 24 would make this more manageable.

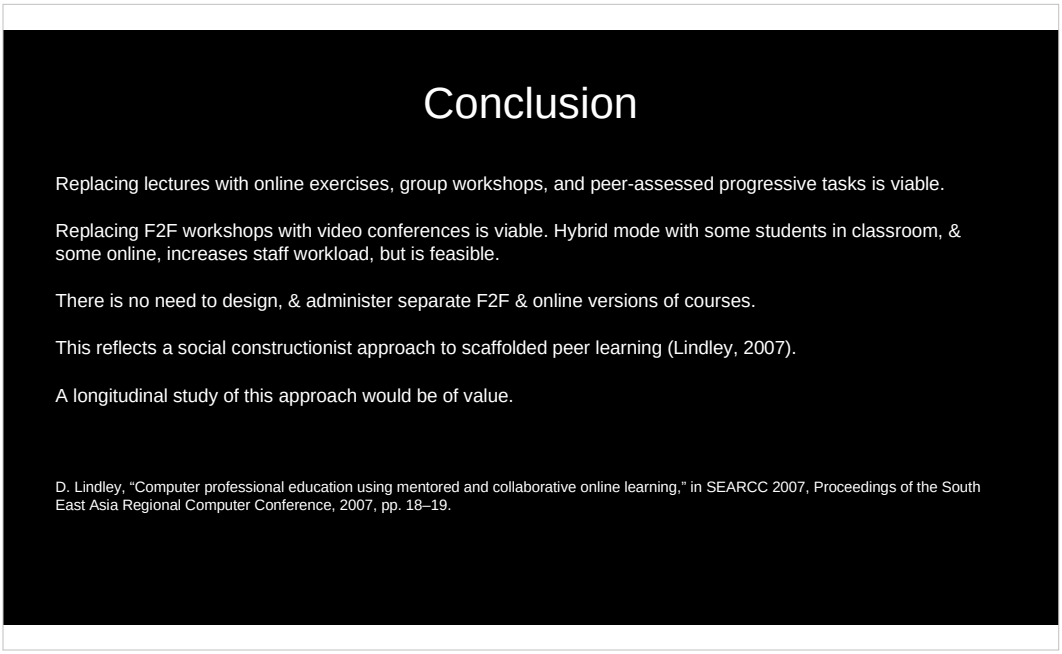
B. Change Marking Scheme

- Fewer marks for early assignments: The first assignment is a practice run for the final exercise, so could have reduced marks and the second, increased.
- Increase the number of peer reviews on assignment: The Moodle workshop algorithm requires at least three peer reviews of each assignment to assess the quality. Ask each student to do four reviews would provide a suitable margin.
- Simplified scale for small assessment items: It can be difficult for peers (and even instructors) to grade on the seven-point scale used. So for small exercises, a simpler three-point scale could be used.
- Have small assessment items contribute only up to a medium-range grade: This technique has been used at ANU previously, to ensure that students can't get a high grade, just from the small exercises (Worthington, 2012). To ensure students actually do the small tasks, require them to get 50% for the total of these, to pass the course.

C. Use standard co-curricular workshops in place of custom ones

- In place of workshops just for TechLauncher students, these students could attend those offered university wide. This would allow students to be offered a choice of times to attend.

D. Supplement tutors with writing analysis tools, such as UTS AcaWriter software tool for academic and reflective writing (http://hdl.handle.net/10453/136846).



Final year international graduate computer science students at an Australian university engineering college undertook online exercises, group workshops, and peer-assessed progressive tasks to assist students to learn to write about learning. The students trialing this approach in 2019 were able to achieve results comparable to a previous class using conventional lectures. These skills are difficult to acquire using conventional lecture and tutorial based teaching. Replacing lectures with online exercises, group workshops, and peer-assessed progressive tasks appears a viable alternative.

The aim of this work was to deliver a usable unit of instruction for students, rather than conduct formal research. What has been implemented reflects a social constructionist approach to scaffolded peer learning (Lindley, 2007).

A longitudinal study of this approach would be of value. However, it is possible that, as with other studies of conventional, versus technology-assisted learning, the ”no significant difference” effect is in play. As teachers, we can only provide an environment for students to learn, and then leave it to them to learn.

Reference

D. Lindley, “Computer professional education using mentored and collaborative online learning,” in *SEARCC 2007, Proceedings of the South East Asia Regional Computer Conference*, 2007, pp. 18–19.

Questions & More Information

Paper on the blended design:

Worthington, T. (2019, December). Blend and Flip for Teaching Communication Skills to Final Year International Computer Science Students. In 2019 IEEE International Conference on Engineering, Technology and Education (TALE) (pp. 1-5). IEEE. https://doi.org/10.1109/TALE48000.2019.9225921

COVID-19 Experience:

Cochrane, T., Narayan, V., Aiello, S., Birt, J., Cowie, N., Cowling, M., ... & Worthington, T. (2021, November). Back to the Future Post Pandemic Socially Constructed Blended Synchronous Learning-Vignettes from the Mobile Learning SIG. In ASCILITE 2021. ASCILITE.

TechLauncher:
https://cs.anu.edu.au/TechLauncher/current_students/

Learning to Reflect Module for TechLauncher, Blog posts 2018 to 2022, with drafts, & commentary:
https://www.tomw.net.au/technology/education/learning_to_reflect/

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