Submission to the Productivity Commission

Executive Summary and Covering Letter

Richard Caladine
20 October, 2022

Re: 5-year Productivity Inquiry: From learning to growth (Interim report no. 5 – September 2022)

Dear Commissioners,

Chapter 4 of the interim report identifies the need to provide high quality teaching in higher education to fuel productivity growth.

Thirty years of working with academics to improve their teaching skills has equipped me to comment and to recommend a way forward. In many cases the teaching skills they were to acquire involved teaching with technology. Most were reluctant to undertake the training as they viewed research are their 'real' job and teaching as a separate chore. A view that was reinforced across the institution as research was rewarded rather than teaching. The report identifies 'the primacy of research' as one of the inhibitors of high quality teaching.

The many and varied attempts to improve teaching and learning at Australian universities have unwittingly maintained, and in some cases exacerbated, the embedded perceived divide between teaching and research.

This divide between teaching and research must be seriously questioned, challenged and replaced.

Today's graduates need research skills to locate, analyse, evaluate, synthesise and communicate information. Rather than attempting to reduce the primacy of research, research should be brought into teaching and learning.

To achieve this higher education needs a overhaul guided by:

- The questioning of content delivery as the main function of lectures.
- Students' need to acquire research skills.
- The post-Covid increased acceptance of screen communications.
- The importance of face-to-face social interactions in learning.
- The importance of communication skills, creative thinking skills and critical thinking skills in graduates.

The enclosed document, ‘Integrating Learning and Research in Higher Education’ builds on the points listed above and describes a future higher education where research and teaching are not viewed as separate activities. A CV and resumé is also enclosed.

The proposed changes to higher education will deliver increases in the effectiveness and efficiency of teaching and learning. Further the changes will result in graduates with the necessary skills and abilities to deliver greatly increased productivity.

I am happy to provide more information and to meet with the commissioners and/or their delegates and their convenience to further discuss the matters raised in this submission.

Richard Caladine PhD (Associate Professor Ret.)

Submission to the Productivity Commission

Integrating Learning and Research in Higher Education

Richard Caladine
20 October, 2022

Australia has a high quality higher education system. However, achieving the best results from it have been inhibited by two broad issues. The primacy of research and the divide, perceived by academics, between research and teaching.

The well-established information age, and the disruption to face-to-face teaching and learning caused by the Covid pandemic present a unique opportunity to reorganise higher education with the goal of producing graduates with the necessary skills to provide increased productivity. Strangely, or perhaps even ironically the skills in demand are very close to the research skills practiced so well by so many Australian academics.

Broad Reasons for Change

Teaching and learning in higher educations need to change. The changes are essential if Australia is to achieve the productivity gains needed to prosper and evolve as a nation.

The reasons for the change are quite clear and are:

- The changed skills graduates require from higher education,
- What they bring to it in terms of skills and needs, and
- Access to and creation of information.

Any change to teaching and learning should be guided by some rather straightforward rubrics.

First, the changes must have a net positive effect on learning. The changes must lead to learning that is more appropriate, more efficient, more effective or all three.

Second, the changes should increase the opportunities for participation in higher education. This can be achieved through a measure of flexibility of where and when students learn. Where there are increased levels of flexibility it must not be at the expense of the human relationships that are central to rich and valuable learning experiences. Through increased participation national productivity gains can be achieved.

Third, the technology students need to complete their study should be technology they are either supplied with or can reasonably be expected to own. Adequate accommodation must be arranged for students who cannot afford technology and for those who need assistance in its operation. Further the technology should facilitate communication between academics and students as well as between students.

Fourth, it must be affordable. Indeed the changes to higher education should have a net reduction in costs to students. An example of this could be a reduction in the number of trips they make to campus.

Employers Require Graduates who have Research Skills

What's the first thing people ask when they find out you work at a university? Usually it is 'What do you teach?' Yet within most universities in Australia the emphasis is on research rather than teaching. Most universities recognise the need to provide high quality teaching and learning yet usually research is rewarded over teaching.

To date the approaches taken to improving teaching and learning at Australian Universities have unwittingly maintained, and in some cases exacerbated, the divide between teaching and research.For example, the NBEET (National Board of Education Employment and Training) in the 80s and 90s, CAUT (Committee for the Advancement of University Teaching) and CUTSD (Committee for University Teaching and Staff Development) in the early 2000s and the AAUT (Australian Awards for University Teaching - current). There were also mode specific undertakings such as NCODE (National Conference on Open and Distance Education) and ACODE (Australian Council on Open, Distance and e-Learning).

In each case the attempts have had limited success as uptake was predominately by the small minority of academics who were teaching enthusiasts and hence invested sufficient time and energy to enable high quality learning. The attempts were 'preaching to the choir'.

In his rather challenging work, Richard Hil (Hil, R. 2012) reports that a majority of academics interviewed summed up their teaching as the price they pay to be a researcher.

The divide between teaching and research must be questioned

The divide between teaching and research must be questioned. Today's graduates need research skills to locate, analyse, evaluate, synthesise and communicate information. Rather than attempting to reduce the primacy of research, research should be brought into teaching and learning.

To achieve this higher education needs an overhaul guided by:

- The questioning of content delivery as the main function of lectures,
- Graduates' need to acquire research skills,
- The post-Covid increased acceptance of screen communications,
- The importance of face-to-face social interactions in learning,
- The importance of communication skills, creative thinking skills and critical thinking skills in graduates.

The research skills needed by graduates can broadly be summarised as, but are not limited to:

- The location, evaluation and analysis of information,

Content

Information is readily accessible
Students need skills to:
- analyse and evaluate information
- synthesise new information
- encapsulate and communicate information

- The synthesis encapsulation and communication of new information.

Previous attempts to encourage academics to increase the quality of their teaching have maintained the divide between research and teaching. This is probably one of the key reasons for their limited success.

Research carried out by students under the supervision of the teacher should be a key component of teaching and learning. Of course when students are guided to locate content, academics are no longer required to deliver all the content required by the course of study. Some limited content may still be delivered where the academic or designer of the learning deems it necessary.

Student researchers may need access to more than the public internet but this is already largely in place. Most university libraries have access to databases of articles, reviewed and otherwise. The free availability of information is valuable only when it is effectively evaluated.

One reaction to the relatively free availability of information is the flipped classroom.

The Flipped Classroom

The concept of the flipped classroom was developed in USA schools and is the flipping of traditional class and homework activities also known as Reverse Instruction. Rather than presenting content in the class and giving students problems for homework in the flipped model the content (usually encapsulated in media) is provided for students to interact with away from school. They can control the rate at which they interact as they have control of the media. In the classroom they can collaborate, tackle problems, lab work, studio work.

> *Flip your instruction so that students watch and listen to your lectures (or those of other expert lecturers, including MIT professors and Salman Khan) for homework, and then use your precious class-time for what previously, often, was done in homework: tackling difficult problems, working in groups, researching, collaborating, crafting and creating. Classrooms become laboratories or studios, and yet content delivery is preserved. (Martin 2011)*

Closely allied to the flipped classroom concept is the Khan Academy (www.khanacademy.org) a not for profit organisation that has developed educational video resources. The founder, Salman Khan attributed its success, in part, to the role it can play in allowing more rich and interactive activities to be undertaken in face to face classes (Cummings 2012).

Can the Flipped Classroom be applied to Higher Education?

How readily can the flipped classroom be adapted for higher education? Clearly it is easier to flip a class of 30 school students than a large university class. Broadly the costs involved in doing this would be the creating of the resources, the planning of the interactive sessions, the execution of the interactive sessions and perhaps a more tiring day for the teacher. However, how can the flipped classroom be applied to a lecture of 500 students without large increases in resources and workload?

The idea of the flipped classroom should stimulate university managers and educators to consider the role of the large lecture. Where large lectures are used to deliver content should

they be discontinued in favour of content that is provided to students in a medium or that students locate for themselves?

In the past, students located information mainly in books, journals and from experts. Today information is available in many places and many media.

What Would it Look Like?

If the amount of content delivered by academics is considerably reduced, significant changes to the structure of teaching and learning are clearly implied. For example rather than weekly (or a predetermined number of) lectures and tutorials a more effective and efficient approach would be to:

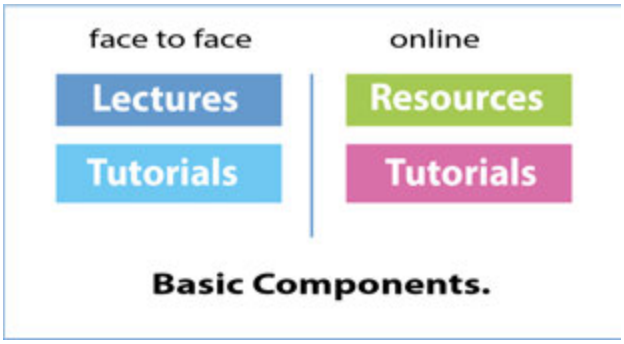
- Adjust (probably reduce) the number of lectures to suit the material, students and the learning objectives,
- Encapsulate some or all content in media (by students and academics), and
- Include some online tutorials.

The overall aim being to increase the efficiency and effectiveness of learning through increased flexibility while enhancing the face-to-face experience. This approach retains opportunities for, in-person, social engagement and collaboration between students and between students and academics. It also introduces opportunities for online (social media) interactions.

The removal of a predetermined number of lectures and tutorials provides the potential for increases in efficiency and effectiveness. Topics are created in modules that are of a size that is appropriate to the material and the learners rather than broken into artificially sized sections.

Apart from specialist laboratories, studios and clinics there are the following proposed components.

- face to face lectures
- face to face tutorials,
- interactions with resources,
- online tutorials,
- content creation.



Blended Learning

The proposed reorganisation of higher education is a form of blended learning or a combination of face-to-face methods and online interactions. This has also been referred to as hybrid or multi-modal learning.

Pedagogical Benefits

The increase in flexibility of where and when students learn, has clear benefits to students who have multiple demands on their time. However, unlike fully online learning, in blended learning some of the social aspects are retained thus enabling the construction of meaning in face-to-face collaboration with other students. The benefits of such a social constructivist

approach are detailed elsewhere (Reznitskaya, Anderson & Kuo, 2007, Corden, 2001, Nystrand, 1996, Weber, Maher, Powell & Lee, 2008 among others) and include:

- the ability to generalise concepts,
- development and/or enhancement of communication skills,
- testing and synthesising ideas,
- solving problems, and
- teamwork and/or building a sense of community.

Environmental Benefits

The proposed form of blended Learning is green. Reducing the amount of travel to and from institutions reduces emitted greenhouse gases. Further the reduced number of students on campus produces less demand for energy consumption for lighting and heat (as well as the provision of parking).

Institutional Benefits

The proposed changes provide higher quality teaching and learning. As gains in efficiency are made academics will have more time for other activities such as interacting with students and research. Learning will be attractive to students for several reasons (detailed later). Thus students will be attracted to the institutions that are early adopters, providing them with a competitive advantage. Further if there is a net reduction of student hours on campus there is potential for to enrol more students without increasing facilities.

Benefits for Academics and Students

The benefits for students and academics are manifold. Students will enjoy the increased ease of learning brought about by using technology and applications they are familiar with as content will be provided by academics and peers in media that are familiar. Academics will benefit in several ways. When students are engaged in the construction of content academics are free to bring to students' learning content that goes beyond basic concepts and thus can be linked more closely to research where appropriate. When content is encapsulated in media, if its shelf life is sufficient, further increases in efficiency can follow.

The Lecture

There's an old joke that goes along the lines of:

> *The definition of a lecture is the transfer of the notes of the lecturer to the notes of the students without passing through the heads of either.*

While this is a rather scathing take on the lecture as learning event it resonates with many. Lectures must have something going for them as they have been in use for hundreds of years and are still used today in most if not all (face-to-face) universities around the world.

Clearly the lecture is an efficient way to present large numbers of students with large quantities of information. However, good lectures can do more than this. They can:

- motivate students to learn by creating interest in the subject material,
- serve as diagnostic sessions,
- allow opportunities for mentoring,

- provide opportunities for student presentations, and
- others.

Further, lectures provide students with visible proof that the lecturer exists which is one important step in establishing the relationship between the lecturer and their students: a relationship that is essential for effective learning.

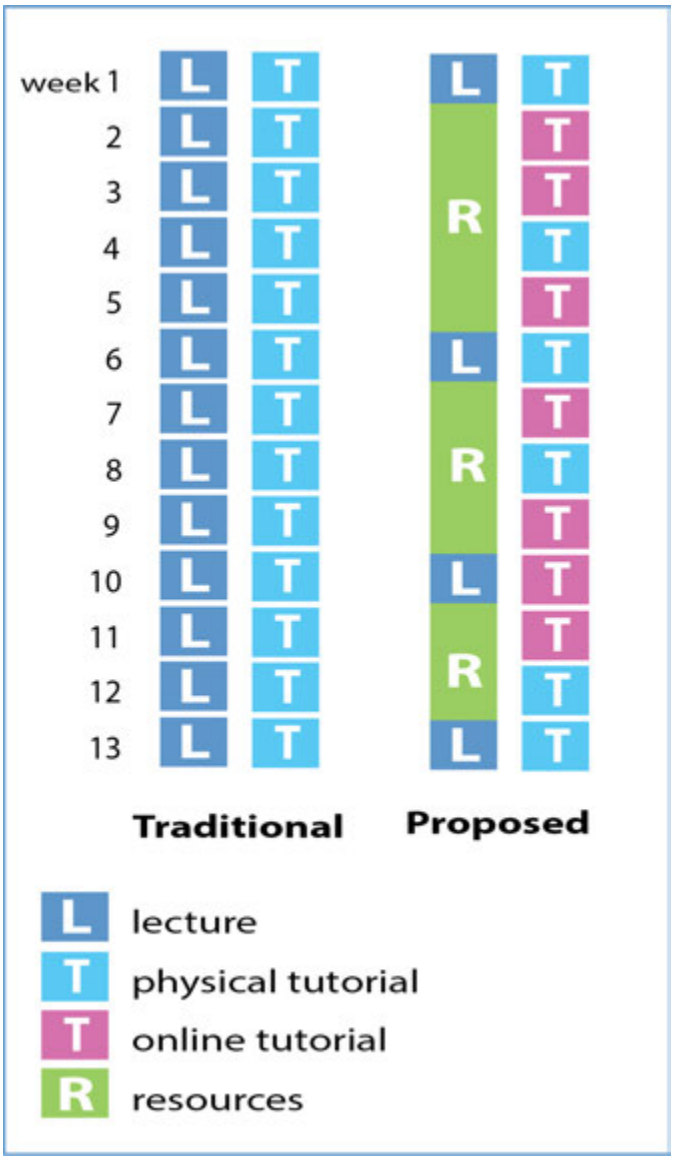
However, many lectures are not good lectures and while this is not reason enough to do away with all lectures, the number of lectures that are fair or not good is an indication of a problem in the system that has lectures as a central teaching and learning activity. The proposal is to keep only the best and most effective lectures as face-to-face events.

Tutorials

Tutorials, or seminars, like lectures have been used in higher education for many years and generally take a more interactive approach to learning. Tutorials have been used for solving problems, student presentations, group discussions, mini lectures, question and answer sessions. As with lectures the number of tutorials in a subject should be determined by the needs of the subject and the students rather than be predetermined by something as arbitrary as the number of weeks in a teaching term.

Curriculum Design

Traditionally curriculum design has faced the task of dividing what is to be taught into the number of weeks in the teaching session. If there are thirteen weeks then there should be thirteen lectures and thirteen (or twenty-six) tutorials. While this can be a neat way to start it is argued that a more efficient approach is to match the number and type of learning events to the material, learning objectives and the students. Learning activities can be considered to consist of two broad categories: content and interactions.



The content is considered for encapsulation either:

- before the teaching session to become resources, or
- during the teaching session by students and/or academics.

Clearly there is a relationship between the shelf life of the content and the expense of encapsulation. The greater the shelf life the more can be spent on the encapsulation. An equation that details this further is presented later. The available media are clearly print, audio and video and can be delivered in traditional forms or the more recent and more accessible ones of websites, videos, podcasts, social media or apps.

When content is encapsulated in media, students have greater choices of when and where they interact with it. However, and more significantly when students interact with encapsulated content the time that was previously spent delivering content in lectures can be put to other uses. Further, online technologies make it easy to enhance interactions with content. In the past interactions with media were often limited to pausing, fast-forwarding or rewinding the tape. The more recent media allow high levels of interaction, user-defined navigation, bookmaking, annotations, analytics (and hence mass-customisation) as well as the gamification of learning experiences.

Student Created Content

Traditionally academics have created most of the content used in teaching. Often the content had three or so sources: lectures, prescribed textbooks and materials found in the library or online. Students have always created content whether in the form of assignments,

presentations, study notes or other. However, technology now provides opportunities for students to encapsulate and share that content which in turn provides the opportunity for greater use of the content. There are numerous benefits of students creating content. Creating content provides opportunities to engage with the creative process of knowledge construction and the key benefit to learning is in the process as well as the product (Chang, Kennedy and Petrovic 2008). Further benefits of student created content include the acquisition of digital media skills required to create the resources and presentation skills in sharing them. These skills have been undervalued in many higher education institutions and include experimenting with ways of presenting information as well as the evaluation of information. Content creation skills can then be brought to their professional or disciplinary specialities.

Academic Created Content

Some content created by academics will still be required in some subjects (perhaps due the volume of content) and in others the student created content will allow academic staff to create content of a different nature. When academics do not have to provide all the content of a subject they are enabled to provide content that has greater depth, is more specific or more recent. Thus, in some cases, moving academic created content closer to and perhaps overlapping with the content they create as research output.

Maintaining the Quality of Content

When content is presented in an unrecorded lecture, to a reasonable degree it is ephemeral. The only records of the lecture exist in the minds and notes of the lecturer and the students. When content is encapsulated greater attention needs to be paid to quality as it is no longer ephemeral. Further if content is sold (as encapsulation can lead to commodification) even greater attention needs to be paid to ensure positive experiences of users. Quality in educational content exists in at least three dimensions. The content must:

- be pedagogically sound,
- have appropriate aesthetics, and
- comply with the laws of the country in which it is sold.

Designing Interactions

Further flexibility can be added to learning through the use of online tutorials. Like the use of content to replace some lectures this has been used in blended and online learning for some years. However, the salient difference suggested here is to replace only some of the face-to-face tutorials with online ones. In this way the 'human face' of learning is retained to an extent. Face-to-face tutorials could be used at significant points in the teaching calendar such as:

- at the beginning to build the relationships between students and between students and academics,
- to cover a topic that student traditionally have struggled with, and
- detailed briefing for assessment.

The discussion tools available are broad. Many of us after Covid are familiar with Zoom as a communication tool. Of course there are others some synchronous, some asynchronous and some are limited to text.

Things that probably have to be face to face

There are some teaching and learning activities that are best conducted face-to-face. Apart from the obvious ones of laboratory classes, clinics and studios (although some of these have been translated to distance education but rarely well or efficiently) there are key lectures and tutorials that are best conducted face-to-face. As detailed earlier, where it is important to establish relationships between academics and students or between students, face-to-face is more efficient and effective. Little has been written about the differences between face-to-face and technology mediated communications. Video communication (e.g. Skype, Zoom or videoconference) is the closest technology-mediated communication to in-person and several publications recognise a limited number of aspects or factors of the differences between them (e.g. apprehension (Campbell 2006), trust (Zheng et al 2002), deixis (context specific language) and gaze (Cherubini, Nussli and Dillenbourg 2008)). In other (yet unpublished) work the author has identified seven other aspects of difference between the two types of communication. These aspects, factors or ways in which video communication differs from physical meetings can be divided into human and technological factors. They are as follows.

Human Factors:

- Apprehension of technology, apprehension of self-image.
- Perception of the framed image compared to perception of a person.
- Context specific language (deixis).
- Trust without touch.

Technological Factors:

- Gaze angle.
- Mismatches between audio and video (lip synch).
- Delays.
- Artefacts of compression.
- Limitations of cameras.
- Limitations of screens.
- Lack of duplex audio.

It is not assumed that the list of factors is complete and it is anticipated that others may be identified during subsequent investigations.

Technologies for Content

Prescribing technologies for the encapsulation of educational content is best undertaken at an subject or course level. Clearly there are differences in ease of modification and commodification that will bias the choice. It is conceivable that institutions will host content in several media and technologies. The decision of which technology to use should happen on a case by case basis. Some selection criteria and described below.

Commodification

Many channels for the distribution of encapsulated content make it simple to commodify them. Students anywhere can access content online either free or for a fee. Commodified

resources can be sold on the open market. The process of placing commodified content onto a distribution channel can involve an approval process and hence increase the time taken to get the content to the market

Interacting with Content

There are differing levels of functionality and hence interactivity between the technologies. For example, web pages can have some level of interactivity. However, apps are where fully interactive experiences can be enjoyed.

Ease of Development

The development of web pages is generally technologically simpler than the development of apps. For this reason one possible determinant of which technology to use could be ease of development. When the learning outcomes are not the development of technology, web pages might be the technology preferred by students tasked to create content as WYSIWYG web builders are readily available and affordable. However, as the institution may have invested in development facilities and resources, content developed by it could conceivably be encapsulated in apps where the added functionality serves some purpose.

Modification

One downside of commodification of content concerns modification. Apps and videos are not as easy to modify as websites. However, modification is necessary to remain current and compatible as new operating systems and technology becomes available. Web pages are easy to modify as the standards (JS, HTML, CSS) exist outside of the technology manufacturers. As well the time between making the modifications and delivery is minimised.

Content that has been encapsulated in media is a key component of the future of higher education. However, production of resources can be expensive in time and money. If institutions desire a fast uptake a great quantity of content will need to be encapsulated in a short timeframe. Achieving this using recordings of lectures has been suggested and caution is advised to ensure diligence is paid to the educational, aesthetic and legal quality of the content.

The establishment of a content production facility can be one way to maximise efficiency as there is a high degree of overlap in the skills required to design and develop the proposed media. Such a facility could provide an authentic learning environment for student acquisition of media production skills.

Economies and Efficiencies

The gains in efficiency can include:

- lowering of the investment required in physical learning spaces (lecture theatres and tutorial rooms
- reducing the workload associated with teaching, by:

    - student creation of content,
    - the encapsulated of content in media, and
    - the determination of the number of lectures based on the needs of the subject and the students.

Student Created Content

In the past media production skills were complex, involving specialised camera and editing equipment. They were often taught as stand-alone units or as adjuncts to media courses. While production skills are more accessible due to the proliferation of consumer software for editing and the ease of technology operation, the production skills required by students concern suitability. In particular the skills required are those of selection of the appropriate medium and the appropriate style for the content. Skills of evaluation are also required and can be obtained through the many feedback channels now available. As content is created for others, evaluation of it can occur easily and could be as basic as number of views of a video on YouTube to the reviews on a web site to the data derived from analytics built into the encapsulation.

Encapsulated Content

In addition to the benefits mentioned above if students create content, which is of sufficient quality, it can be reused for subsequent offerings of the course or subject. Furthermore if students create some or most of the content academics are freed from the tasks of creating and/or delivering that content. Given the immense breadth of topics taught across higher education it is impossible to predict what will work best in terms of student and academic created content. In some subjects it might be appropriate for:

- students to create all the content,
- students to create none of it,
- the content may be created collaboratively by both academics and students, or
- sections of the content to be created by students and other parts by academics.

In cases where academics create encapsulated content there is potential for efficiencies to be gained over the delivery of content in lectures. These efficiencies are proportional to the shelf life of the content.

Efficiency of Encapsulated Content

There are several factors that need to be considered in evaluating the efficiency of encapsulated content. These factors can be represented as a mock mathematical equation with the costs of development and maintenance, in time and money on one side and the educational benefits on the other. The following table lists the factors that are part of the equation. Of course trying to fit one equation to the vast array of topics and student cohorts in higher education is difficult so some generalisations have been made and the equation is intended as a guide rather than an exact tool into which values for the variables can be placed and a numerical answer derived. This becomes completely obvious when the benefits to learning are included as these are particularly difficult to quantify.

c	production costs
h_2	hours spent in production (academic's time)
o	other costs
h_3	hours spent on each update (academic's time)
n	number of updates required in l
l	shelf life of resource
h_1	reduction in contact and preparation hours
b_1	benefits to learning
b_2	release of facilities
b_3	environmental benefits

Factors in the Efficiency of Encapsulated Content.

The factors mentioned in the above table can be grouped into costs and benefits. For any efficiency to be present clearly the costs must be smaller than the benefits. These are arranged below.

$$\text{Costs} = c + h_2 + o + h_3 n$$

$$\text{Benefits} = l\,h_1 + b_1 + b_2 + b_3$$

Costs and Benefits of Encapsulated Content.

Granularity of the Costs and Benefits

The equation comparing costs and benefits of encapsulating content can be applied at different levels of granularity. It could be applied at the institutional level to measure gross benefits. Alternatively it can be applied at the school or unit level. Further and perhaps in the earlier instances the equation can be applied to individual courses of study or subjects.

Costs = Benefits, no change in efficiency
Costs > Benefits, reduced efficiency
Costs < Benefits, Increased efficiency

Efficiency of Encapsulated Content.

The change in efficiency is obtained by comparing costs and benefits. Cleary if the cost and the benefits are determined to be equal then there is no change in efficiency. However when costs are less than the benefits efficiency has increased and conversely when costs outstrip benefits efficiency has decreased.

Production Costs (c, h_2, o)

Production costs may be in time or in money. When an academic is responsible for the production of encapsulated content there are several models by which the production costs may be met. In some cases the production facility might be made available by the institution at no cost while in other cases production might be on a cost recovery basis or full charges may apply. In terms of the efficiency equation there are two types of costs. The cost, in money, charged by the production facility and the academic's time spent working with the producers to develop and approve the content. To minimise production cost in money, the academic might choose to create the resource themselves. In this case while the money to produce the resource is minimised the time taken can be significant. As well checks need to be in place to assure educational, aesthetic and legal quality. Other costs can apply and include items such as payments to copyright holders, writers, evaluators etc.

Shelf Life and Updates (l, n, h_3)

There is a clear relationship between the shelf life of content and the cost effectiveness of encapsulating it in media. If the content for a particular unit of study changes completely each semester or year then the costs of encapsulation must be kept to an absolute minimum for there to be any gains in efficiency. On the other hand, in units of study where the majority of the content remains the same from year to year then there are clear benefits as the encapsulated content can be reused. In many units of study the content has two clear sections; that which stays the same and that which changes. When choosing the media in which the content is encapsulated, ease of modification is important for content that changes frequently. Costs to update resources can be calculated as the number of updates required in the life of the resource multiplied by the average time taken to prepare and perform each update. This can include costs in terms of academic's time and production fees.

Benefits (h_1, b_1, b_2, b_3)

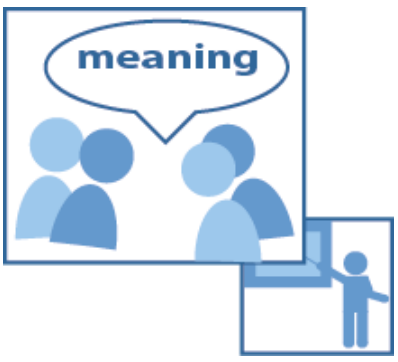
The benefits arise from several areas. Firstly the experience of learners is enhanced through the reduction or removal of content from face to face classes. Content when presented in lectures or other classes is largely ephemeral. When content is encapsulated in media it can be revisited by students on demand and reused for subsequent offerings of the unit of study. While this benefit is real it is difficult to measure in terms of hours of an academic's time or money as the benefit has several aspects. Clearly students benefit from an enhanced learning experience. As well academics benefit from a more fulfilling teaching experience and the institution gains in reputation. Academics also benefit from a reduction in contact hours. Other benefits arise as less on campus facilities are required due to the replacement of some lectures and some tutorials. Another way to conceptualise this benefit is to consider the student capacity of the institution to increase without any increase in physical facilities. Further there is an environmental benefit when students to travel to campus on fewer occasions.

Implementation and Support

For many institutions the proposed changes represent a significant departure from the way they are used to doing things. While the requirements of implementation and support differ there is a degree of commonality and in many cases the difference will be primarily one of emphasis.

Where models of teaching and learning are mainly ones of content delivery by traditional lectures and tutorials much has to change and in these instances the introduction of reform can be expected to be significantly disruptive. The disruption occurs due to the changed institutional ethos as the power relationship of teacher and taught is changed. When students and academics both create content some academics may feel that their traditional power base has been eroded. Therefore an overall management strategy that maintains the focus of all members of the institution on the goal of changing learning for the better is essential.

Managing the Change



Inevitably any change will be met with some level of resistance and it is not expected that the proposed reforms will be immune. Perhaps the goal of change management in such cases is to hear the reasons for the resistance and to adapt the process of change (and perhaps the program, timeframe or outcomes) in the light of the resistance. An overall strategy of inclusive management should mitigate high levels of resistance. Such a strategy could include the following stages.

- Stakeholder assisted planning,
- Initial briefings,
- Initial consultations,
- Multi-channel communications,
- Feedback and further consultations, and
- Monitoring and evaluation.

Stakeholder Assisted Planning

During the planning stage prior to the transition, focus groups with early adopters will provide a robust and more acceptable plan as they can provide reasons for the proposed changes. For example asking early adopters why they use a particular aspect of the approach can elicit information that can be used to pitch the changes to other users.

Initial Briefing

The initial briefing of students, academics and support staff should clearly outline the reasons for, and nature of the proposed changes. The goals, timeline, benefits and costs as well as the process should be made clear to all stakeholders. Further the facilities and programs of support should be detailed. At the initial briefing the communications plan should be detailed. The communications plan should include many opportunities for stakeholders to have input to the proposed program and process of conversion to it. The display of examples of content encapsulated in media will provide stakeholders (including students) with an elementary understanding of the products they may produce.

Initial Consultations

The initial consultations will provide academics, support staff and students opportunities to question and revise any or all aspects of the initial briefing. The initial consultation will also provide management with a formative assessment of the levels of acceptance of the changes among the stakeholders. The initial consultations will produce the timeline and goals for the project. These could be conducted on a school, faculty or institution-wide basis.

Multi-Channel Communications

To ensure that the conversion is as efficient as possible multi-channel communications are recommended. These could include social media and repositories of policies developed, face-to-face events as well as guides and examples of all relevant aspects. The communications would serve also to provide an indication of the progress made to date towards the previously defined goals. The communications strategies should be included in a communications plan with a timeline so that all stakeholders can see where they are in the transition process as well as the stages.

Feedback and Consultation

Ongoing feedback from and consultation with academics, support staff and students will inform the project of successes and failures as well as facilitate the sharing of pitfalls to be avoided and successes to be emulated. The feedback should be multi-channel so that it is timely and precludes the escalation of minor problems.

Monitoring and Evaluation

As well as consultation and feedback, monitoring of the progress of the conversion of units of study will provide an indication of the level of progress. Thus when and where progress is markedly better or worse than predicted the appropriate action can be taken in a timely fashion. Of course evaluation of any new process or procedure is central to determining its effectiveness and should be ongoing.

Initiatives to encourage uptake

In past years when significant changes to teaching and learning arrangements have been made, incentives have often been provided to ensure success. The incentives to encourage

academics and support staff to overcome the institutional inertia and convert units of study to the proposed must be determined by each institution.

Further, to make the change as easy as possible appropriate levels of support from development units and facilities need to be provided. Such support will span all aspects of the project including:

- Staff development,
- Student development,
- Curriculum redesign,
- Media production, and
- Training in the new ways of teaching and learning.

Support units can also be instrumental in providing incentives that drive the change. Converting units of study can be combined with small research projects that result in publications comparing the same unit of study in of traditional and new modes.

Another initiative is to ensure that the conversion of subjects is included in the institution's criteria for progression. In this way an academic who converts a unit of study and publishes about it can reap multiple rewards from the same project.

The change will be disruptive. In some cases where the metrics of working arrangements are face-to-face hours, changes to the agreements and contracts of work will need to be achieved through consultation and bargaining.

Staged Implementation

For some institutions the change may be quicker while others might elect to change over the course of years. Some may elect to change all subjects while others might change only some. There is no question that the proposed changes will create a temporary increase in workload for the teaching staff. For this reason alone it is recommended that a staged implementation be adopted. There are several ways in which this can happen.

Some institutions may make opportunities to convert available to all teaching staff and rely on the usual early adopters to be the first to convert. This model can then use diffusion of the concepts and results of the changed units of learning to encourage broader uptake. Other institutions may take an approach that targets individual faculties or schools. In cases where the time taken for the whole institution to change may be longer, resource production can be spread over this longer time. Another approach is to convert some subjects in senior years first. So that entry-level students who are not used to university life are not confronted with the need for greater self-management on their immediate entry to university.

Preparation

The support needs for the proposed changes are different in emphasis than those for traditional learning. The design, development and maintenance of pedagogically sound

resources is at the heart of the proposed. Higher than normal levels of educational development support are required in the transition from traditional learning as curricula are redesigned, and teachers and students are trained in new ways to teach and learn. As mentioned levels of pedagogical support will need to be higher as will levels of technical support.

To minimise the disruptive effects of the change, preparation programs for students, academics and support staff will be required. To complete the support of the implementation, facilities and expertise in the production and encapsulation of content in media need to be readily available. This may mean that exiting resource production facilities will need greater output and hence resourcing. While there is some overlap the preparation programs need to be tailored to each of the three groups of stakeholders. The preparation of all involved should commence with:

- An explanation of the proposed changes,
- The reasons why the institution is embracing it,
- An overview of it in the institutional context,
- The guiding policies and timeframe.

Preparing and Supporting Students

Preparing students for new ways of learning can be complex where there is a wide range of abilities with technology. Clearly digital natives will find the encapsulation of content in media a relatively easy task while mature aged students may struggle with coming to terms with the technology. Briefing students on the benefits should increase their acceptance of it.

A sensitivity to students' needs must be heightened as they bring differing levels of expertise with technology, social media and digital resources to their learning. At least four avenues of student support are necessary:

- Training in research skills of locating, evaluating, analysing, synthesising and communicating information.
- Training in resource creation.
- Guidance in accessing resources and in learning with them.
- Guidance in what's expected of them and how to participate in online tutorials.

These requirements are underpinned by institution's network and students will require seamless, wireless, high bandwidth connection to it.

One way to ensure that all students meet the minimum requirements for use of technology is to provide a mandatory digital literacies course on entry. Many institutions have existing information literacies units which may need to be enhanced. Such a unit of study would provide an introduction to information theory and the theory behind the encapsulation of content as well as technology selection and practical advice on production. As the location, evaluation, analysis, synthesis and communication of information are key elements an introduction to this is relevant in an introductory unit of study. If these research skills are included in the workflow of the encapsulation process from the outset, it becomes an undeniable part of the process. Further if post-production reviews are included students gain

in two ways. Firstly they are encouraged to perform well as their work will be scrutinised and secondly their awareness of methods of review (e.g. expert and peer) is raised. In this way the evaluation of existing information, the synthesis of new information and the review of the created information all form part of the process of encapsulating content in media.

Preparing and Supporting Academics

As well as the overview and policies academics will need guidance on how the changes can be applied to their particular field. In some cases this may take a discovery approach which could best be achieved in conjunction with curriculum development support staff.

Academics will need assistance in the redesign of curriculum. Determining the number of face-to-face lectures and tutorials is an opportunity to provide academic staff with support in the face-to-face methods they will use as well as the resources and other aspects. While determining the number they will need to determine which of them will be face-to-face and which will be online. The criteria for the determination of which events are online and which are face-to-face can vary depending on the students, their locations, their access to technology, budget, course topic and others.

Assisting subject designers in the design or redesign of subjects could be undertaken in a content production facility. However, it may be more appropriate for these activities to be designed and undertaken by the relevant academic development or educational development unit within the institution.

Academics will also require assistance in technology selection for the resources and support in the creation of them. They will require assistance in creating pedagogically sound, aesthetically appropriate and legally safe resources. Further, designers of subjects will require guidance in where students can access the digital skills required for production and curriculum design assistance in how to make student created content a meaningful part of the subject.

Academic staff should be presented with three options for the creation of resources. Those with the necessary skills can build the resources themselves, others can be provided with varying levels of assistance. A further option of to have the resources fully developed by professional developers either internal or external to the institution. Academic staff will also need assistance in the design, conduct and evaluation of online tutorials. They will also need assistance in navigating and organising the social media selected for the online tutorial.

Preparing and Supporting Support Staff

Key to the success is a well-trained and up to date support staff. Support staff will work in the two broad areas of education and technology.

Development officers will work in faculties and/or schools where their main role will be helping academics convert units of study. To do this effectively they will need training in all aspects of curriculum development and design. As well they will require a deep understanding of the proposed changes, how they can be applied to different fields of study and have a firm grasp of the reasons why the institution is embracing them. In the initial stages they will often act as evangelists for the new methods of teaching and learning.

Development officers will need a background in educational development and have an understanding of the application of technology to learning.

Two types of technical support staff are required. Educational technology officers will be involved with the encapsulation of content and IT support staff who will ensure that students and staff can connect seamlessly to the institution's wireless network from a range of devices.

Educational technology officers will need to have an overview of the learning experience so that the encapsulated media products they create or help create are appropriate for the content and the unit of study. The educational technology officers will also be involved with the training of academic staff and students. As such they will need to be well prepared as trainers. They will need ongoing support to remain current with the technologies used.

IT support staff will also require an overview of the changes so that they have an understanding of the ways in which the technologies are used. They will be required to support the wide variety of devices students and staff bring to the institution. In many cases this might entail an increase in the number of IT support staff.

Conclusion and Further Work

The changes proposed in this paper are broad and will certainly prove to be disruptive. Further work is needed to determine the details of the changes for each particular institution and within in each of those each unit of study. Further work should also look at inter-institutional resource sharing or trading. Having each Australian university (or indeed each university in the world) produce the same resources is an obvious inefficiency.

The changes will require increased levels of support for all involved including, academics, students, support staff and administrators. The timeframe for a return on the rather hefty investment should be thankfully short. However, this will depend on the courses changed. Courses with a high degree of content that does not change will enjoy quicker returns than those requiring great changes.

The proposed changes to higher education appear extreme. However, the benefits are great. They range from the increased effectiveness and efficiency of learning to the production of graduates with the skills and abilities to increase the nation's productivity.

References

Campbell, J. (2006) Media Richness, Communication Apprehension and Participation in Group Videoconferencing. *Journal of Information Technology and Organizations.* Volume 1, 2006

Corden, R.E. (2001). Group discussion and the importance of a shared perspective: Learning from collaborative research. Qualitative Research, 1(3), 347-367.

Chang, R., Kennedy, G. and Petrovic, T. (2008) Web 2.0 and User-Created content: Students Negotiating Shifts in Academic Authority. Proceedings of ASCILITE 2008. Accessed 20 October 2022 from https://ascilite.org/conferences/melbourne08/procs/chang.pdf

Cherubini, M., Nussli, M. and Dillenbourg, P. (2008) *Deixis and Gaze in Collaborative Work at a Distance (over a sheared map): a Computational Model to Detect Misunderstandings.* ETRA '08 Proceedings of the 2008 symposium on Eye Tracking Research & Applications

Cummings, P. (2012) World Wide Ed. Good Weekend Magazine, Sydney Morning Herald, September 29, 2012 Fairfax: Sydney

Hil, R. (2012) Whackademia: An insider's account of the troubled university. UNSW Press Sydney, Australia

Martin, J. (2011) Advancing the Flip: Developments in Reverse Instruction. In Connected Principals (blog). Accessed 19 October 2022 from https://21k12blog.net/2011/02/13/the-flipped-classroom-advances-developments-in-reverse-learning-and-instruction/

Nystrand, M. (1996). Opening dialogue: Understanding the dynamics of language and learning in the English classroom. New York: Teachers College Press.

Reznitskaya, A., Anderson, R.C., & Kuo, L. (2007). Teaching and learning argumentation, The Elementary School Journal, 107(5), 449-472.

Weber, K., Maher, C., Powell, A., & Lee, H.S. (2008). Learning opportunities from group discussions: Warrants become the objects of debate. Educational Studies in Mathematics, 68 (3), 247-261.Accessed 22 October 2022 from https://www.researchgate.net/publication/225446414_Learning_opportunities_from_group_discussions_Warrants_become_the_objects_of_debate

Zheng, J., Veinott, E., Nathan, B., Olson, J. and Olson, G. 92002) *Trust without Touch: Jumpstarting long-distance trust with social activities.* Proceedings of CHI 2002. CHI Letters 4(1)