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Transformative Learning & Teaching in Economics – Why, What, How and for Whom?

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Challenges

- Teachers as **facilitators** rather than a reservoir.
- **Larger** cohorts & **Diverse** cohorts.
- **Homogeneous** courses across universities.
- **Homogeneous** courses across time.
- Learning content versus **learning how to learn**.

The Existing Approach

-
- Initially focuses on **concepts which are foundational, fundamental or core** to the respective discipline.
 - Learners **add knowledge and application over previously laid** foundational, fundamental and core knowledge.
 - Focuses on the **addition of knowledge**.
 - ... and therefore focuses on the **accumulation of content**.
 - **Input focused.**

Threshold Concepts

-
- Meyer and Land (2003) argued that each discipline possesses threshold concepts that are:
 - ... akin to *passing through a portal [or] conceptual gateway [that opens up] previously inaccessible way[s] of thinking about something.*
 - Again in Meyer (2016) – “**Threshold Concepts Framework**”.
 - Output focused

The Threshold Concept Approach

-
- The threshold concept approach addresses both **the way of thinking** as well as **the way of practice**.
 - Passing through the portal or gateway of the threshold concept **transforms** the learner such that they are able to **practice the train of thought of their discipline** by **integrating** these concepts.

Characteristics

-
- **Transformative**
 - **Troublesome**
 - **Irreversible**
 - **Integrative**
 - **Bounded**

TEQSA –

Economics Learning Standards for Australian Higher Education



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- **Knowledge**
- **Application**
- **Data Analysis**
- **Communication**
- **Reflection**

QAA – UK Benchmark Statement for Economics



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- **Subject knowledge and understanding.**
- **Generic skills.**
- **The transferable concept.**
- **Numeracy.**

Transforming elements of the curriculum

- Meyer & Land (2003)
 - threshold concepts
 - opportunity cost
- O'Donnell (2010)
 - critique
- Gray & Blake (2013)
 - consultation with stakeholders
- Davies & Mangan (2005)
 - what the threshold concepts are



-
- **Economic Models**
 - **Opportunity Cost**
 - **Marginal Analysis**
 - **Equilibrium vs Disequilibrium**
 - **Elasticity**
 - **Welfare & Efficiency**
 - **Market Structures & Market Interactions**
 - **Comparative Advantage**
 - **Real vs Nominal**
 - **Cumulative Causation**

Transforming elements of the curriculum

- **Hedges & Pacheco (2013) & Hedges (2014)**
 - **blank slate**
 - **capability building rather than content acquisition**
- **Dyer (2012)**
 - **assessment wording**
- **Shanahan, Foster & Meyer (2010) –**
 - **measure threshold concept acquisition empirically**
 - **Test of Economic Literacy**
 - **multiple choice questions**
 - **first two weeks and last two weeks**

Transforming elements of the curriculum

- Tang & Robinson (2010)
 - everyday life economic scenarios
- Davies & Mangan (2005)
 - three types of exercises:
 - reflective
 - problem-focused
 - threshold network exercises
- Bajada, et. al. (2016)
 - re-marking final exam scripts



Constrained Optimisation

Learning & Teaching – a constrained optimisation problem

- **Maximise learning outcomes**
- **Maximise student experience**
- **... subject to...**
- **Constraints**
 - **Time**
 - **Resources**
 - **Assessments**
 - **Content**

Learning & Teaching – a constrained optimisation problem

- **Two Stage Approach:**
 - **“Macro Level” – re-sequence the teaching**
 - **→ the WHY of learning & teaching**
 - **“Micro Level” – re-scaffold the learning**
 - **→ the HOW of learning & teaching**

“Macro” Level → the WHY → Re-sequence the Teaching



- Using the Threshold Concepts as a guide (output focused).
- As opposed to the Foundational Concepts as a guide (input focused).

| | Microeconomic Principles |
|----------------|--------------------------------------|
| Week 01 | Introduction to Economics |
| Week 02 | PPF and Comparative Advantage |
| Week 03 | Demand and Supply |
| Week 04 | Elasticity |
| Week 05 | Efficiency |
| Week 06 | Government Actions in Markets |
| Week 07 | Externalities |
| Week 08 | Consumer Theory |
| Week 09 | Producer Theory |
| Week 10 | Perfect Competition |
| Week 11 | Monopoly |
| Week 12 | Monopolistic Competition |
| Week 13 | Oligopoly / Game Theory |

Threshold / Transferable Concepts in Economics



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- **Economic Models**
- **Opportunity Cost**
- **Marginal Analysis**
- **Equilibrium vs Disequilibrium**
- **Elasticity**
- **Welfare & Efficiency**
- **Market Structures & Market Interactions**
 - **Comparative Advantage**
 - **Real vs Nominal**
 - **Cumulative Causation**



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A Transformed Curriculum by Integrating Threshold Concepts

| | Microeconomic Principles |
|----------------|--------------------------------------|
| Week 01 | Introduction to Economics |
| Week 02 | PPF and Comparative Advantage |
| Week 03 | Demand and Supply |
| Week 04 | Elasticity |
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| Week 06 | Government Actions in Markets |
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| Week 10 | Perfect Competition |
| Week 11 | Monopoly |
| Week 12 | Monopolistic Competition |
| Week 13 | Oligopoly / Game Theory |

| | Previous offerings | New offering |
|----------------|-------------------------------|---------------------------------------|
| Week 01 | Introduction to Economics | Introduction to Economics and the PPF |
| Week 02 | PPF and Comparative Advantage | Producer Theory |
| Week 03 | Demand and Supply | Perfect Competition |
| Week 04 | Elasticity | Demand and Supply |
| Week 05 | Efficiency | Monopoly |
| Week 06 | Government Actions in Markets | Monopolistic Competition |
| Week 07 | Externalities | Elasticity |
| Week 08 | Consumer Theory | Efficiency |
| Week 09 | Producer Theory | Externalities |
| Week 10 | Perfect Competition | Government Actions in Markets |
| Week 11 | Monopoly | Consumer Theory |
| Week 12 | Monopolistic Competition | Game Theory / Oligopoly |
| Week 13 | Oligopoly / Game Theory | Comparative Advantage |

| | Previous offerings | New offering | Threshold Concepts |
|---------|-------------------------------|---------------------------------------|--------------------|
| | | | Models |
| Week 01 | Introduction to Economics | Introduction to Economics and the PPF | Marg Analys |
| Week 02 | PPF and Comparative Advantage | Producer Theory | Opp Cost |
| Week 03 | Demand and Supply | Perfect Competition | Equil / Diseq |
| Week 04 | Elasticity | Demand and Supply | Mkt Struc |
| Week 05 | Efficiency | Monopoly | Elasticity |
| Week 06 | Government Actions in Markets | Monopolistic Competition | Elasticity |
| Week 07 | Externalities | Elasticity | Efficiency |
| Week 08 | Consumer Theory | Efficiency | Efficiency |
| Week 09 | Producer Theory | Externalities | Efficiency |
| Week 10 | Perfect Competition | Govt Actions in Markets | Several |
| Week 11 | Monopoly | Consumer Theory | Mkt Struc |
| Week 12 | Monopolistic Competition | Game Theory / Oligopoly | Comp Adv |
| Week 13 | Oligopoly / Game Theory | Comparative Advantage | |

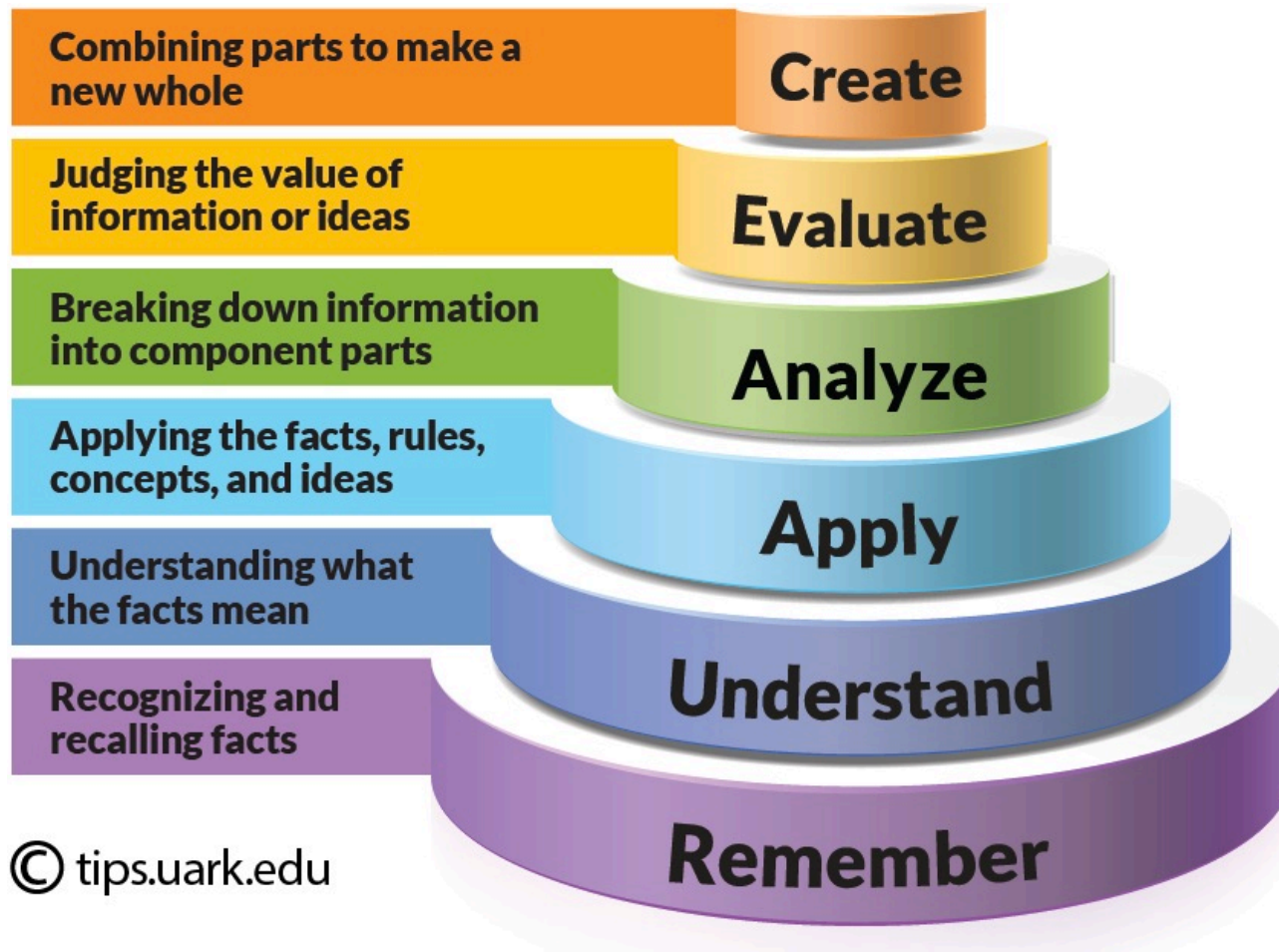
“Micro” Level → the HOW → Re-scaffold the Learning

- **Assessments for Learning → Boud (2000)**
- **Learning how to learn → Anderson and Krathwohl (2001)**

Boud (2000)

-
- *Sustainable assessment: rethinking assessment for the learning society*
 - Assessment **for** learning rather than
 - Assessment **of** learning

Anderson and Krathwohl (2001) - revised Bloom's taxonomy



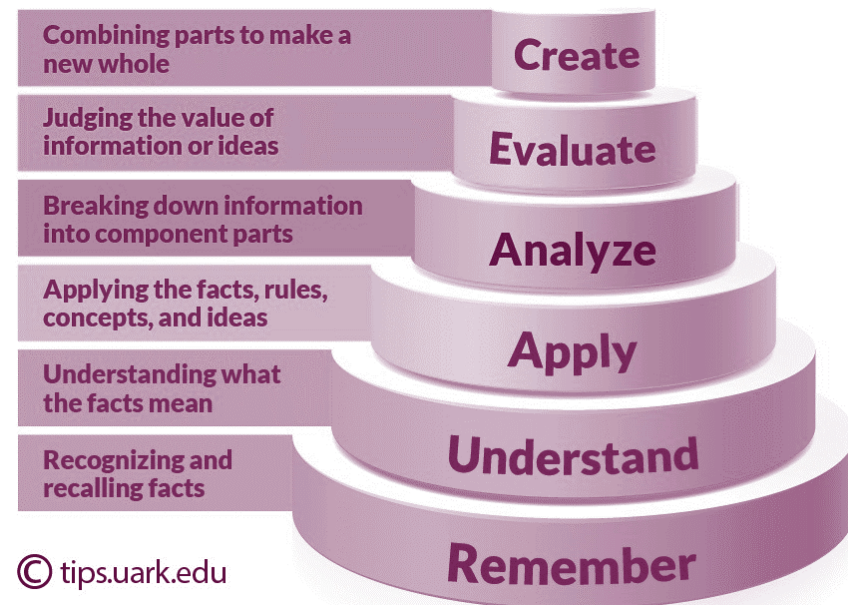
Australian Qualifications Framework (AQF)

- **Knowledge** is what a graduate knows and understands
- **Skills** are what a graduate can do
- **Application of knowledge and skills** is the context in which a graduate applies knowledge and skills.

R.E.A.L. as a pedagogy

- **R** – Re-cap & Remind
- **E** – Economics Everyday
- **A** – Application & Awareness
- **L** – Learning

Life Lessons





MICROECONOMIC PRINCIPLES

Tutorial Questions and Solutions

Topic: Government Actions in Markets
Externalities

The Economics Threshold Concepts engaged in this topic:

- Welfare & Efficiency

The threshold concept that is engaged is explicitly mapped to the weekly content.

ECONOMICS IS

R – RE-CAP & REMIND

E – ECONOMICS EVERYDAY

A – APPLICATION & AWARENESS

L – LEARNING LIFE LESSONS

Bloom's taxonomy is adapted to economics in a memorable way. Each tutorial question is based on this taxonomy, and the question progression encourages a transformation of the student and focuses on the 'how' of learning.

APPLYING ECONOMICS TO EVERYDAY LIFE SITUATIONS LIKE:



Budget 2016-17

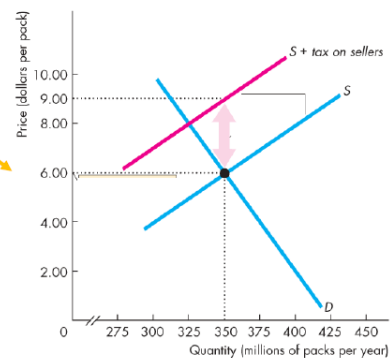
Explicit mention and explicit use of real-time and relevant examples to engage the student – drawing attention to the 'why' of learning.



RE-CAP & REMIND

Per unit taxes are known as excise taxes under ATO terminology. One product category that attracts excise taxes in Australia is the product category of cigarettes. Consider one such situation below:

Basic revision of lecture content and key concepts.



- According to the diagram on the previous page, what is the **equilibrium** price and quantity before tax? How much is the government tax on cigarettes? How much **tax revenue** does the government collect?
- What price do **producers receive** and what price to **consumers pay** after tax? Calculate the tax **incidence** (burden) borne by producers and consumers.
- Show how both consumers and producers both carry a **burden** from such a tax.
- What will determine the overall burden of the tax?
- Is the tax **efficient**? Explain.
- When can such a tax be efficient? Explain.
- Show that the incidence (burden) would have been exactly the same, had the per-unit tax been imposed on buyers instead.

Key concepts to be noted are highlighted and woven into questions.

Solutions

Colour coded files – with solutions in blue.

The tax equals \$1.25. This is the vertical distance between the two supply curves.
Tax revenue = \$1.25 x 18 billion = \$22.5 billion.
Producers receive \$2.50 from consumers but keep only \$1.25 after paying the tax to the government.



The incidence of the tax is \$0.25 on the producers and \$1 dollar on the consumers

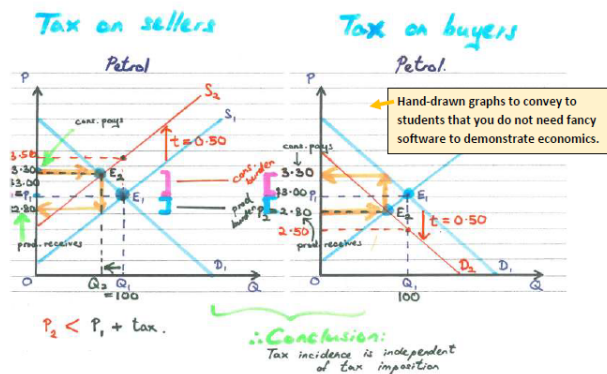
In general, the imposition of a tax on a market causes a wedge to be driven between the price received by the seller and the price paid by the buyer. This causes the marginal social benefit from the last unit sold to be higher than its marginal social cost, and the market will under-produce the good or service being taxed. If more of the good or service were produced, the marginal social benefit gained would be greater than the marginal social cost incurred, and the net benefit to society would increase. (Identify the area of DWL in the graph above and calculate it).

There are TWO ways a tax could be efficient:

1. When externalities are not present in the first place - A tax is efficient, that is, creates no deadweight loss, when demand is perfectly inelastic or supply is perfectly inelastic. In both these cases a tax does not change the quantity produced and so creates no deadweight loss.
2. When externalities are present in the first place - A tax could take the market from an inefficient equilibrium to an allocatively efficient point.

Thus - please note that:

If there are no externality issues, the market is already allocatively efficient - thus a tax (or any government intervention for that matter) will create inefficiency.



If there are no externality issues, the market is already efficient - thus a tax will not create inefficiency if the demand and/or supply curves are perfectly inelastic.

If there are externality issues, the market is not allocatively efficient to begin with, and thus a tax could make the market more allocatively efficient.



On the 3rd of May 2016, the Federal Treasurer, Scott Morrison, announced the Federal Budget for the 2016-17 financial year.

As is usual in any federal budget, the treasurer announced various changes to taxes and subsidies.

Explicit attention and signposting of current economic events – highlighting the 'why' of learning.

ECONOMICS EVERYDAY



One proposition in the new federal budget is an increase in the tax on cigarettes.

Assume that the tax is a per-unit tax.

For the aforementioned cigarette tax:

- Who is it logistically more practical to impose such a tax on and why?
- From the budget's point of view, why would a tax hike for cigarettes make sense?
- From a social point of view, why would a tax increase on cigarettes make sense?
- Is the budget proposal more likely to be effective for (b) or (c)?

Visual cues to give students a sense of familiarity as well as importance of economics.

What determines the size of the burden (incidence)?

$\therefore \downarrow E_D \rightarrow \text{cons. burden?}$

$\therefore \downarrow E_S \rightarrow \text{prod. burden?}$

Visual cues to link mathematics with theory and its application.

Solutions

The government will choose to impose the tax on the buyer or the seller due to either political concerns or logistical constraints (because as we've proved above, the incidence (burden) is independent of who the tax is actually imposed on). It would be logistically and practically easier to impose it on sellers rather than the buyers.

From a budget point of view – a tax hike on cigarettes makes sense – inelastic demand, small change in Q – therefore a large increase in government revenue.

From a social point of view – a tax hike on cigarettes makes sense – discourages consumption, health issues, etc.

This is a good question to create a small group discussion. I would say the budget view is more effective than the social view because in the end demand is relatively inelastic. But, there is some research to prove otherwise. We encourage a debate in class, and see how this debate goes!



APPLICATION & AWARENESS



Visual cues to make students realise that economics is everywhere – why they are learning.

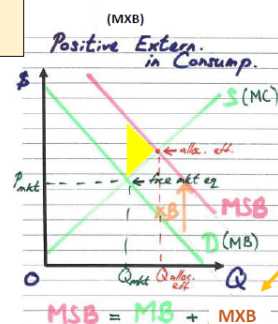
Assume that the consumption of re-usable shopping bags creates a positive **externality** for **third parties** / **by-standers** because of the reduced negative impact on the environment.

- Draw a demand and supply diagram that exhibits this externality using the **steps for questions on externalities** on the following page.
- What are some solutions to address this **market failure**?
- Are such solutions **allocatively efficient**?

Steps for answering questions on externalities:

- Start with a demand and supply diagram at equilibrium at E1 – this is the **unregulated market equilibrium**.
- Identify which party is causing the externality – you have to shift *their* curve.
- Determine whether you shift this curve in #2 up or down.
- Draw the new curve, and label this curve **Marginal Social Cost** (if you shift S) or **Marginal Social Benefit** (if you shift D).
- Construct an equation to reflect this shift: $MS_{_} = _ + / - _$
- Label the new intersection the '**social optimum**' / 'allocatively efficient' point.
- Note whether the unregulated equilibrium is over-production or under-production.
- Mark the **deadweight loss**, based on your answer to #6.

Step-by-step guidance on how to tackle any question on this topic – guiding student on how to learn.



Making the visual connection using graphs and colour-coding with mathematics – to assist students with a weak mathematical background



If there are no externality issues, the market is already allocatively efficient – thus a subsidy (or any government intervention for that matter) will create inefficiency.

If there are no externality issues, the market is already efficient – thus a subsidy will not create inefficiency if the demand and/or supply curves are perfectly inelastic.

If there are externality issues, the market is not allocatively efficient to begin with, and thus a subsidy could make the market (more) allocatively efficient.

LEARNING LIFE LESSONS

The progression through: R, E, A, and then onto L, transfers the 'how' of learning, especially for deeper, evaluative and critical learning.



Visual cues to help students realise that economics is not restricted to the world of business, but that economics is everywhere – why they are learning.

- What are **property rights**?
- What is the **Coase Theorem**?
- Read the article below and explain how the Coase Theorem can be applied to this case – to show how a market failure can be avoided / corrected.
- What are some other possible solutions?

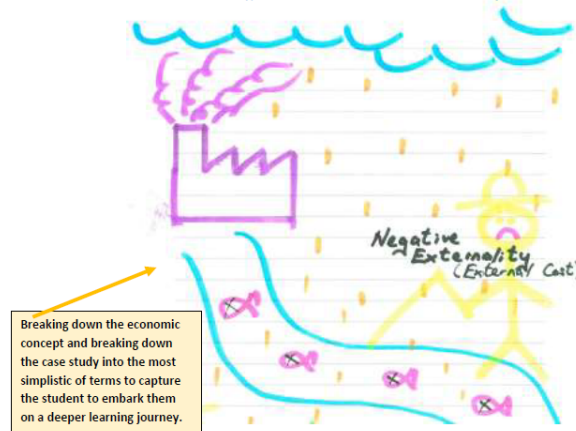
External links to reputable news sources such as the ABC to further engage students with economics.

<http://www.abc.net.au/radionational/programs/sundayextra/new-zealand-granting-rivers-and-forests-same-rights-as-citizens/7816456>

- **Property Rights**
 - Sometimes externalities arise because of the absence of property rights.
 - Property rights are legally established titles to the ownership, use, and disposal of factors of production and goods and services that are enforceable in the courts.
- **The Coase Theorem**
 - The Coase theorem is a proposition that if property rights exist, only a small number of parties are involved, and transactions costs (defined below) are low, then private transactions are efficient.
 - There are no externalities because all parties take into account the externalities involved.
 - The outcome is independent of who has the property rights.



This is a great article for a life lesson and to create a discussion – the article is interesting because the theorem works regardless of who owns the river. For example below:



The Coase theorem would work regardless of who had a property right for the river. If the fisherman owned the river, the polluting firm would have to either not pollute or compensate him/her for polluting the river, for fear of being sued by the fisherman. If the firm owned the river, the fisherman would have to pay the firm to not pollute the river (which the fisherman would, so long as the MB of fishing outweighed the MC of paying the firm to not pollute). In either case, the externality becomes internalized.

The article is interesting because it is a proposition not discussed in the traditional first year textbook, where the proposal is that the river becomes a legal person and has a property right for itself – it can represent itself (or be represented) in a court and thus sue those that infringe on its property rights.

Other Solutions

- Taxes
- Emission charges – Australia: “carbon tax”
- Marketable permits – Australia: “emissions trading scheme”

Linking the formal discipline terminology to the contemporary terminology of the Australian context.



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Assessing the Curriculum #1 – Student Learning Experience

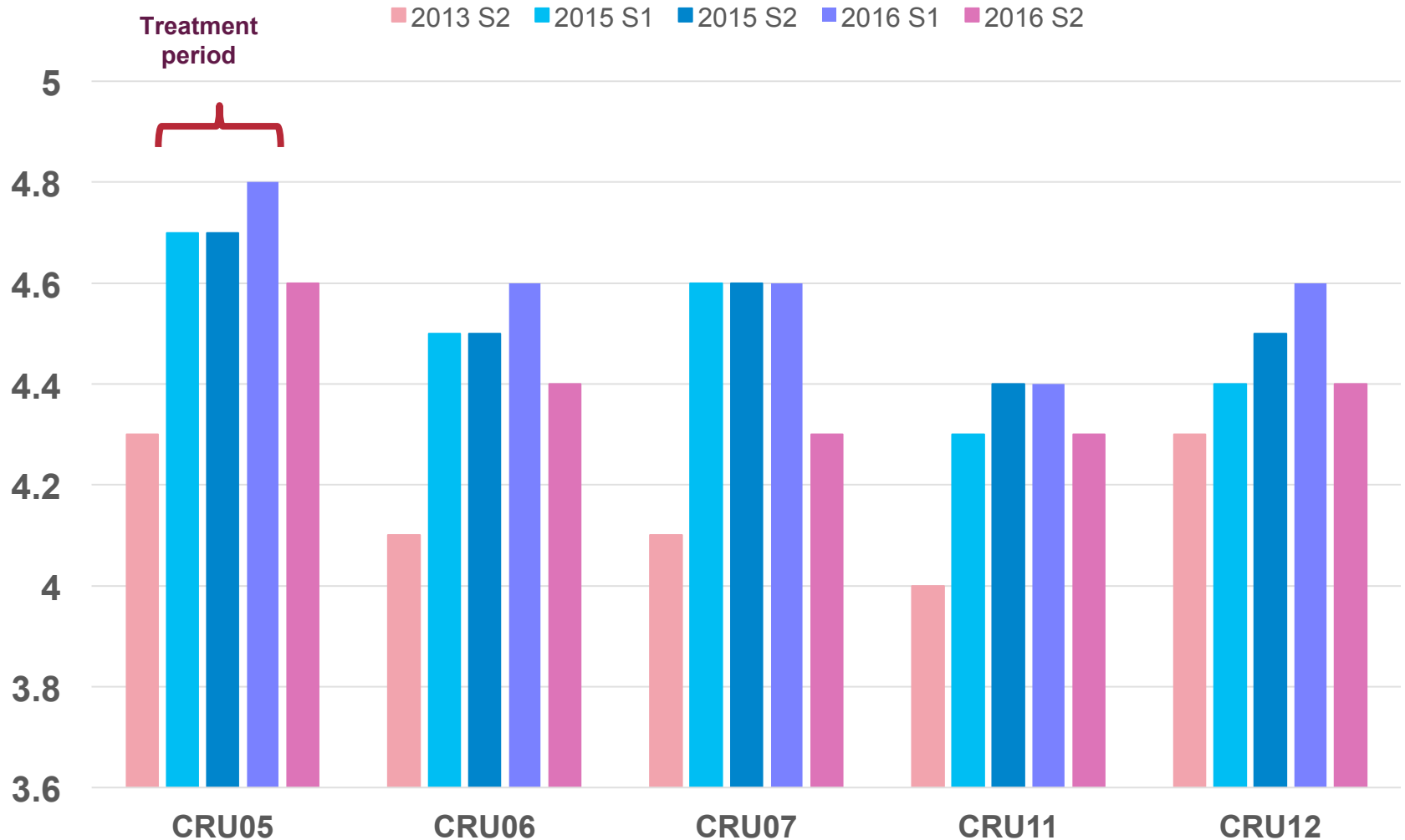
Survey Questions

| Question Code | Survey statement |
|---------------|---|
| CRU05 | The unit content was organised in ways that assisted my learning . |
| CRU06 | Teaching sessions (face-to-face and/or online) kept me engaged in the unit. |
| CRU07 | The unit's learning activities (e.g. assessments, in-class or online discussions and exercises) were effective in developing my understanding . |
| CRU11 | This unit contributed to my development of one or more of the MQ graduate capabilities . |
| CRU12 | This unit challenged me intellectually . |

Student Average Responses

| Question | 2013 S2 | 2015 S1 | 2015 S2 | 2016 S1 | 2016 S2 |
|----------|---------|---------|---------|---------|---------|
| CRU05 | 4.3 | 4.7 | 4.7 | 4.8 | 4.6 |
| CRU06 | 4.1 | 4.5 | 4.5 | 4.6 | 4.4 |
| CRU07 | 4.1 | 4.6 | 4.6 | 4.6 | 4.3 |
| CRU11 | 4.0 | 4.3 | 4.4 | 4.4 | 4.3 |
| CRU12 | 4.3 | 4.4 | 4.5 | 4.6 | 4.4 |

Student Experience Surveys



Two sample t-tests

| Question | 2015 S2 | 2015 S1 | 2013 S2 | t statistic | p-value |
|----------|---------|---------|---------|-------------|---------|
| CRU05 | 4.7 | 4.7 | 4.3 | 9.379 | 0.000 |
| CRU06 | 4.5 | 4.5 | 4.1 | 7.919 | 0.000 |
| CRU07 | 4.6 | 4.6 | 4.1 | 8.892 | 0.000 |
| CRU11 | 4.4 | 4.3 | 4.0 | 7.882 | 0.000 |
| CRU12 | 4.5 | 4.4 | 4.3 | 4.969 | 0.000 |



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Assessing the Curriculum #2 – Student Learning Outcomes

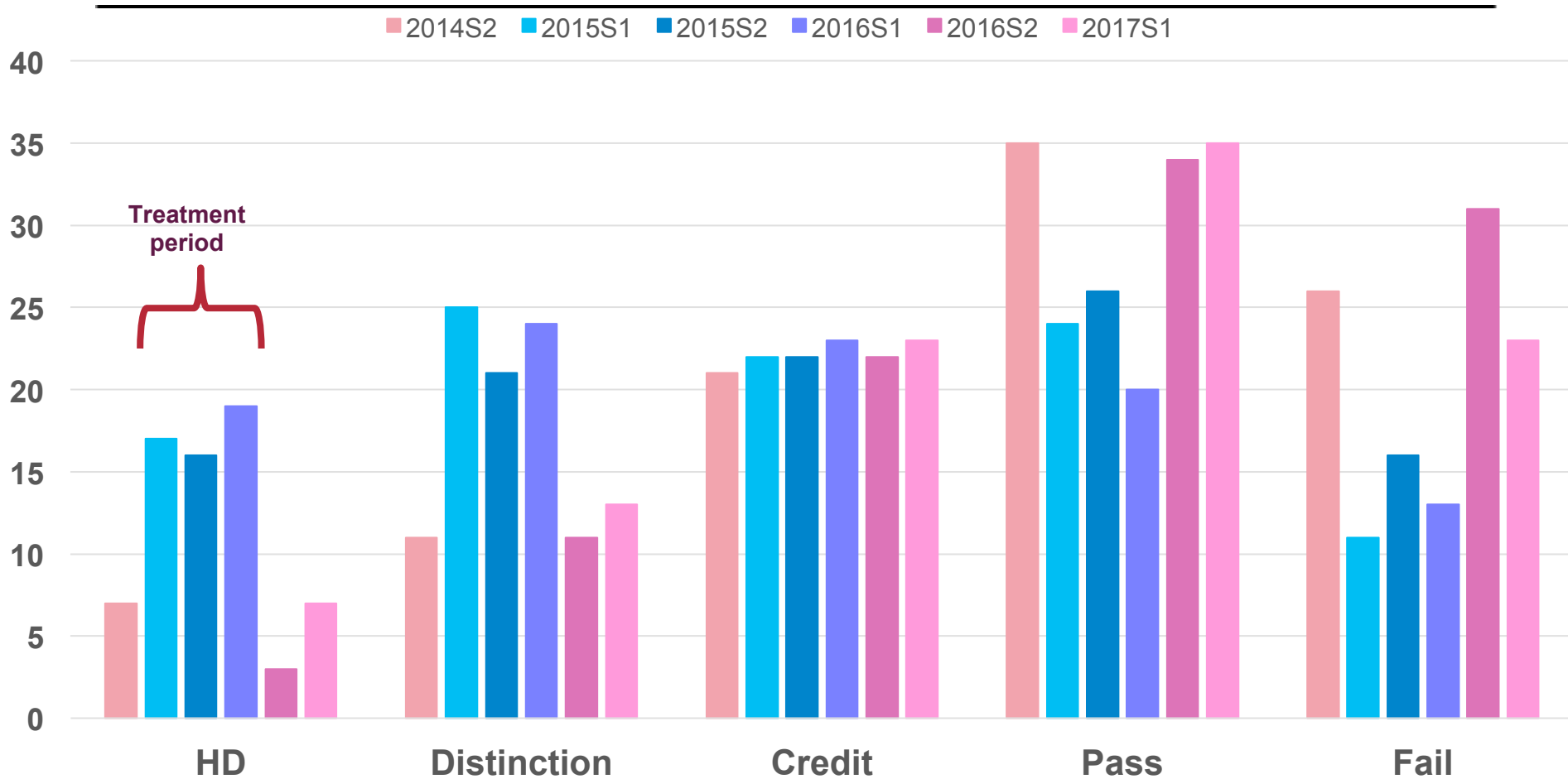
Student Grade Descriptors

| Grade name | Letter grade | Standardised Numerical Grade range |
|------------------|--------------|---------------------------------------|
| High Distinction | HD | 85 – 100 |
| Distinction | D | 75 – 84 |
| Credit | Cr | 65 – 74 |
| Pass | P | 50 – 64 |
| Fail | F | 0 – 49 |
| Fail Absent | FA | |
| Fail Withdrawn | FW | |

Grade Distribution 2014 S2 - 2017 S1



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Z-test of proportions

| | Percentage Change | Z statistic | p-value |
|-------|----------------------|-------------|---------|
| HD | 50.9 | 4.397 | 0.000 |
| D | 29.5 | 3.609 | 0.000 |
| Cr | 1.3 | 0.203 | 0.419 |
| P | -10.2 | -1.802 | 0.036 |
| F | -47.2 | -5.993 | 0.000 |
| FA | -16.3 | -1.387 | 0.083 |
| FW | -49.5 | -2.510 | 0.006 |
| FAILS | -37.6 | -6.277 | 0.000 |



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Assessing the Curriculum #3 – The Student Voice

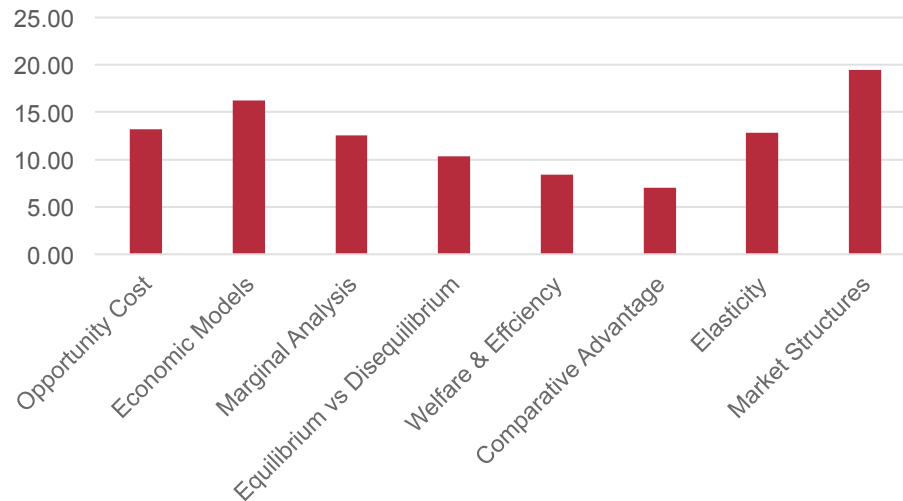
The Student Voice



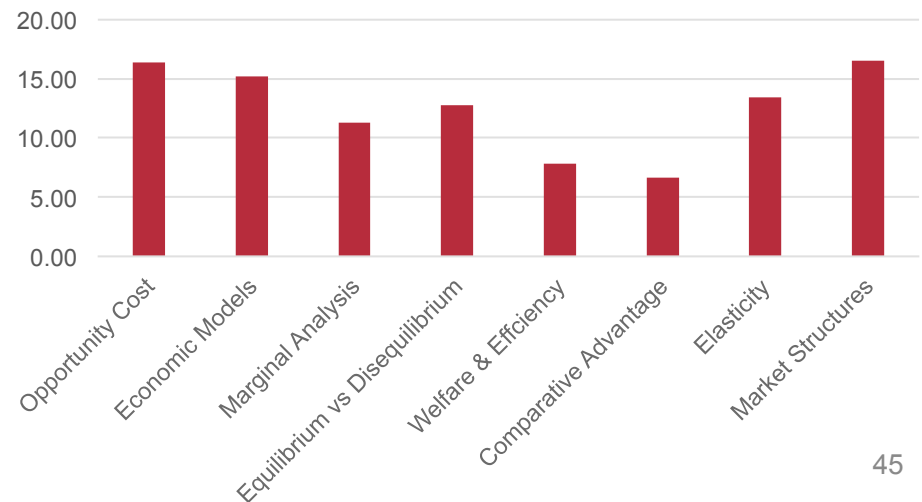
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WHAT IDEAS ARE ESSENTIAL? (%)

Essential Ideas



Essential Ideas

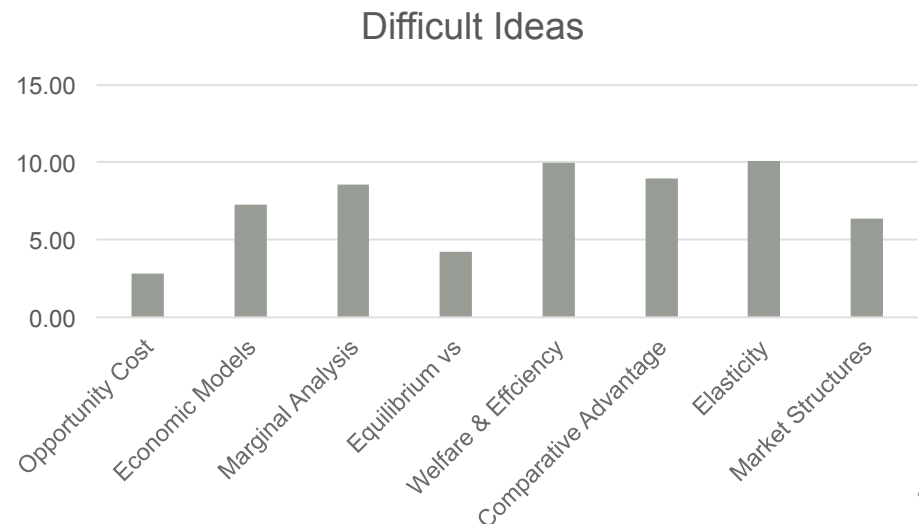
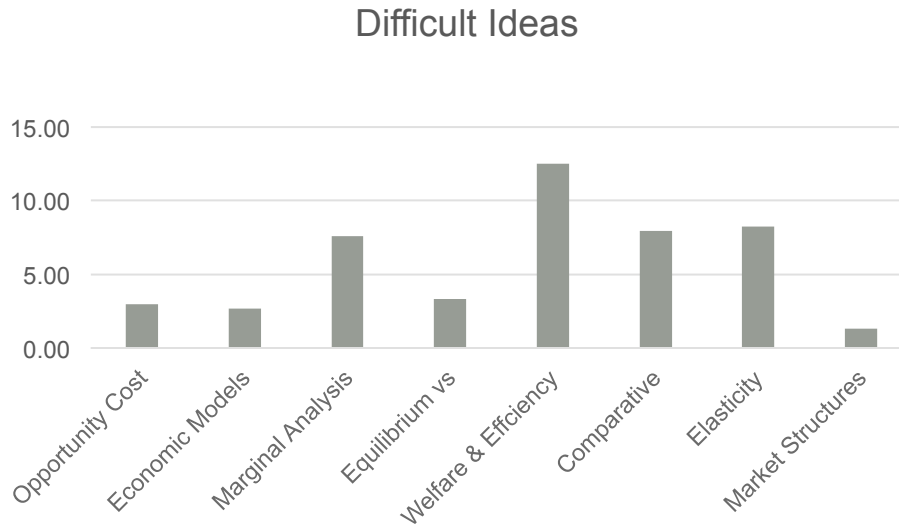


The Student Voice



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WHAT IDEAS ARE DIFFICULT TO LEARN? (%)





Conclusion

The Experience & Outcomes

-
- An improvement in the **student learning experience** indicated by the LEU results
 - An improvement in **student learning outcomes** indicated by the improved grade distribution.

Summary

-
- **More organised in a way that promotes student learning**
 - **Offers face-to-face sessions that are more engaging**
 - **Has assessments that are more effective in developing student understanding**
 - **Contributes more to the development of their graduate capabilities**
 - **The course is more intellectually challenging.**

Links

-
- <http://prashankarunaratne.wixsite.com/teaching>
 - https://mqedu.qualtrics.com/jfe/form/SV_2ujd3g0y1aO4fKR
 - <https://www.facebook.com/macquarieuni/videos/10153754215001990/>