Acknowledgement of Country

I acknowledge and pay respect to the ancestors and descendants of the Lands upon which we work, meet and study.

I am mindful that within and without the buildings, the Land always was and always will be Aboriginal Land.

Southern Cross University

Online Simulations: Scaffolding learning experiences with authentic assessment

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Today's Presentation

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Online Simulations: Scaffolding learning experiences with authentic assessment

Turning a Pressing Imperative into a Great Opportunity: The Southern Cross Model

- The Situation:
  - 12 Credit Point units moved from 120 to 150 hours.
  - Delivery periods compressed from 12 weeks to 6 weeks.
  - Class contact moved from 36 hours ((2+1)x12) to ~18-21 hours ~((2+1)x6).
  - Final Written Exams "largely" abolished.
  - Administrative turnaround moved from ~4 weeks to < 2 weeks (CoE to Start).

- The Pressing Imperative:
  - How do we proactively address this and prosper (not just survive) in this situation?

- The Great Opportunity:
  - Is not in acceleration nor in intensification and certainly not compression!
  - Is in transformation – which is inherently:
    - scholarly, researchable, publishable, and commercialisable.

What I am not addressing

- Praxis based simulations
- Video Games
- Busy Work
- Baby Sitting
- Running Down the Clock

Source: William Angliss Institute (WAI)

What I am addressing

Pedagogically sound use of online digital gaming technologies, namely serious game simulations, to drive student engagement in developing their key learning outcomes and using that to underpin authentic assessment.

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Frameworks + Theories + Perspectives

- The Reflective Practitioner (Donald Schoen's "reflective practice")
- Constructive Alignment (John Biggs' "constructive alignment")
- Authentic Assessment (Richard Stiggins' "performance assessment")

Frameworks + Theories + Perspectives

- The Reflective Practitioner
  - Ontology
  - Phronesis
  - Praxis and Exegesis

Images from Hotel Management Magazine

Frameworks + Theories + Perspectives

- Constructive Alignment
    - The Australian Qualifications Framework (AQF)
    - SCU Graduate Attributes
    - Course Learning Outcomes
    - Unit Intended Learning Outcomes
    - C.U.T.E.: In business it is: P = R - E.

Frameworks + Theories + Perspectives

- The AQF

AQF DIMENSION	EXPLICATORS	AQF 5	AQF 6	AQF 7	AQF 8	AQF 8	AQF 9
		Diploma	Assoc. Degree	Bachelors	Grad. Cert.	Grad. Dip.	Masters
		Work in Industry/Community	Manage in Industry/Community	Lead in Industry/Community	Modify processes in Industry/Community	Change policy in Industry/Community	Transform systems in Industry/Community
KNOWLEDGE	The body of **knowledge applied** increases from established and simple to advanced, contemporary and integrated	technical and theoretical knowledge in a specific area or a broad field of work and learning	broad theoretical and technical knowledge in a specific area or a broad field of work and learning	broad and coherent theoretical and technical knowledge with depth in one or more disciplines or areas of practice	advanced theoretical and technical knowledge in one or more disciplines or areas of practice	advanced and integrated understanding of a complex body of knowledge in one or more disciplines or areas of practice	advanced, integrated and critical understanding of a complex body of knowledge in one or more disciplines or areas of practice
TASK	The difficulty of the **task undertaken** increases from straightforward and routine to complex and novel	within broad but clearly established parameters	within broad parameters to provide specialist advice and functions	within broad parameters to provide specialist advice and functions	within complex and novel parameters	within complex and novel parameters	within complex and novel parameters
CONTEXT	The nature of **the context** increases from unambiguous and certain to ambiguous and uncertain	in known or stable contexts	in contexts that are subject to change	in contexts that require self-directed work and learning	in ambiguous and uncertain contexts	in ambiguous and uncertain contexts	in highly ambiguous and uncertain contexts
AUTONOMY	The level of **autonomy** exercised increases from close to minimal supervision	demonstrate limited autonomy, judgement and clearly defined responsibility	demonstrate autonomy, judgement and defined responsibility	demonstrate autonomy, well-developed judgement and responsibility	demonstrate autonomy, well-developed judgement, adaptability and responsibility as a practitioner or learner	demonstrate autonomy, expert judgement, adaptability and responsibility as a practitioner or learner	demonstrate autonomy, expert judgement, adaptability and professional responsibility as a practitioner or learner

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Frameworks + Theories + Perspectives

- The SCU Graduate Capabilities

CAPABILITY	WHAT DOES THIS MEAN?
Intellectual rigour	a commitment to excellence in all scholarly and intellectual activities, including critical judgement.
Creativity	an ability to develop creative and effective responses to intellectual, professional and social challenges.
Ethical practice	a commitment to sustainability and high ethical standards in social and professional practices.
Knowledge of a discipline	command of a discipline to enable a smooth transition and contribution to professional and community settings.
Lifelong learning	the ability to be responsive to change, to be inquiring and reflective in practice, through information literacy and autonomous, self-managed learning.
Communication and social skills	the ability to communicate and collaborate with individuals, and within teams, in professional and community settings.
Cultural competence	an ability to engage with diverse cultural and Indigenous perspectives in both global and local settings.

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- The THS Graduate Capabilities

Personal Disposition:	Reflect on, critically analyse, and judge their own professional conduct and performance in tourism/hospitality/events settings that are dynamic and unpredictable and analyse their consequent impacts; describe, analyse, and prioritise theoretical areas to improve their own professional conduct and performance within ==broad parameters in diverse settings==.
Numeracy + Data Literacy:	Interpret, analyse and explain operating data and financial reports; conceptualise, model, and visualise business problems via digital tools; and make data-driven recommendations and decisions for ==the short and medium and long term==.
Business Acumen:	Make commercially astute recommendations and decisions and recognise and pursue ==internal and external commercial opportunities==.
Interpersonal Skills:	Use appropriate communication approaches for various audiences, including guests, fellow staff members, and superiors) and develop and apply functional and strategic solutions for contexts that are ==complex, dynamic and ambiguous== (e.g. dealing with difficult guests).
Leadership:	Strive for personal and professional development and encourage and lead others to perform at high levels, seek challenges and solve problems, and create and pursue opportunities within ==reasonably well defined environments in response to ~~readily identified~~ identifiable challenges==.
Entrepreneurship:	Take calculated risks to achieve results within reasonably well defined environments in response to ==~~readily~~ ~~identified~~ identifiable challenges==.
Global Citizenship:	Demonstrate and apply broad discipline specific knowledge and skills with a ==global perspective==.

Frameworks + Theories + Perspectives

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- And don't forget the Course Learning Outcomes

Graduate Certificate	Graduate Diploma	Masters
1008460	1108430	1209230
AQF 8	AQF 8	AQF 9
Modify processes in Industry/Community	Change policy in Industry/Community	Transform systems in Industry/Community
To provide graduates of the course with the skills and professional confidence to apply contemporary leadership techniques to the global hotel sector. Graduates will be prepared to succeed in a lower management roles within hotel organisations.	To provide graduates of the course with the skills and professional confidence to apply contemporary leadership techniques to the global hotel sector. Graduates will be prepared to succeed in a middle management role across a range of hotel and hospitality settings.	To provide graduates of the course with the acumen, skills and professional confidence to apply contemporary leadership techniques to the global hotel and hospitality sectors. Graduates will have the professional knowledge to succeed in a global management role across a range of hotel and hospitality settings.

Frameworks + Theories + Perspectives

- And, lucky last, the Unit Learning Outcomes

HOTL6010 Revenue and Analytics

Explores strategic revenue and yield maximisation in the hotel industry through the application of revenue and big data analytics, technology enablers, and business intelligence to drive profitability.

ILO 1	Examine principles of strategic pricing for customer buying behaviour in the hotel industry
ILO 2	Evaluate revenue management systems in hotels and links to big data analytics
ILO 3	Identify and interpret principles of customer/segment profit contribution
ILO 4	Evaluate and propose appropriate revenue management practices for driving profitability in the hotel industry

Frameworks + Theories + Perspectives

- Authentic Assessment

  - External: Our licence to operate
    - Assure a Student's Mastery of the Course Learning Outcomes

  - Internal: Our retention of students
    - Engaging, Meaningful and Relevant for the student as a "pre-graduate".

Authentic Assessment

- The Hospitality Industry tends not to read, and certainly does not write.
  - But we love a busy spreadsheet and a colourful graph!!
- Career Success is driven by:
  - Operational Performance
    - Generating superior business results.
  - Executive Committee Meeting Performance:
    - Communication skills based on presenting and explicating data and performance.
    - Praxis and Exegesis.
- Two ideal assessment modes:
  - STTARR Model
  - Socratic Dialogue.

Masters
1209230
AQF 9
Transform systems in Industry/Community

To provide graduates of the course with the acumen, skills and professional confidence to apply contemporary leadership techniques to the global hotel and hospitality sectors. Graduates will have the professional knowledge to succeed in a global management role across a range of hotel and hospitality settings.

Images from Hotel Management Magazine

Where's the technology?

Ready Player One

- Gamification: feedback and scores
- Intuition: C.U.T.E
- Strategy: safe environment for trial and error
- **Immersion + Feedback =**
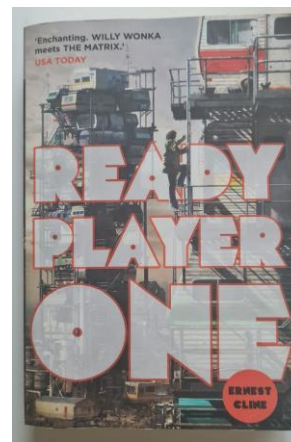 - **Teacher Presence**
  - **Student FLOW**

Image from Tina van Eyk

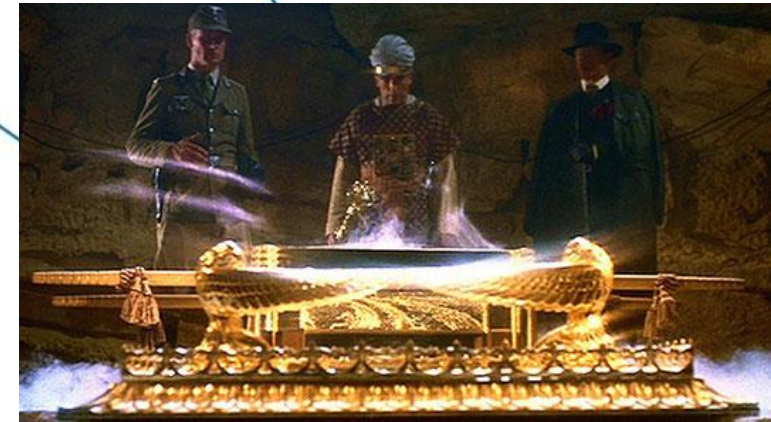Source: Creator: Leesle | Credit: Getty Images/iStockphoto

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Image from Paul Whitelaw

The McGuffin

Source: Raiders of The Lost Ark. Paramount Picture, 1981

- Coined by Alfred Hitchcock: "a plot device".
- Think in terms of some famous movies:
    - The Maltese Falcon (of the same name)
    - The Ark of the Covenant (Raiders of the Lost Ark)
    - The Briefcase (Pulp Fiction) (does anyone know what was in the briefcase? Does it matter?)
    - The Ring, my precious (Lord of The Rings) (notice all are golden?)
- A tool to drive **the behaviours required of the characters** in the film.

For us, it is a tool to drive our students to demonstrate the required learning outcomes. It's not the pedagogy, it's just a tool.
The rules, and rewards (which you determine) shape and drive the desired behaviours.

Source: Pulp Fiction. Mirimax Films, 1994

The BIG WIN

- Gamification creates:
  - Student Competition – extrinsic rewards (record voucher?)
  - Student Competitions (vendor sponsored international comps.)
- All students confronting the same:
  - Theory
  - Concepts
  - Environment
- Individual or Group (depends on the ILOs).
- Truly unique data:
  - By student
  - By study period (and even within study period)
- The Simulator records and reports each student's data.
  - That data then provides the basis for authentic assessments.

Students Make Decisions

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Revenue Management

Late Bookings

If less than 45 % Occupancy, quote price 80 % of normal

If less than 55 % Occupancy, quote price 90 % of normal

If more than 85 % Occupancy, quote price 100 % of normal

Note: Late bookings make up 10% of total bookings

Merchant website discount 15 %   Package rate discount 15 %

Weekday Room Letting Limits

	Groups	Conferences
	5 %	15 %

Weekend Room Letting Limits

	Groups	Conferences
	5 %	10 %

☑ Allow Overbooking

☑ Direct Reservations   ☑ Expedia   ☑ Booking.com   ☑ Hotels Online
☐ Priceline   ☑ Opodo   ☐ Orbitz   ☐ Expedia Opaque

HOTS Online - Instructor
Year 3 January Team 1

Read Messages

Decisions

View Previous Decisions: Week Y3 January Wk1   Year 3 January Week 1

Rates

☑ Set prices for all weeks

		Discount for no breakfast	Discount for non-cancellable	Discount for 3+ Nights
Weekday Rooms	$185.00	15 %	15 %	20 %
Weekend Rooms	$175.00	15 %	15 %	25 %
Weekday Executive Rooms	$255.00	11 %	15 %	20 %
Weekend Executive Rooms	$245.00	11 %	15 %	25 %
Weekday Suites	$285.00	12 %	15 %	20 %
Weekend Suites	$275.00	12 %	15 %	25 %

		Weekend Discount	Rooms	Revenue Split Food	Conf Rooms.
Conferences (per person per 24 h)	$185.00	20 %	70 %	20 %	10 %
Groups	$130.00		75 %	25 %	
Events	$160.00	30 %		20 %	80 %

Contracts

	Weekday	Weekend
Min Rate	85	100

Update

☑ Gresham Wines   More Information

| Rates | Rev Mgt | F&B | Staff | Training | Advertising | EMS | Refurbish | Guest Comfort | Extra Facilities | Finance |

Save & Exit   Save changes   Cancel & Exit

Oversight of individual results

HOTS SCORECARD

COMPARISON OF TEAM RESULTS **End of Year 1**

KEY INDICATORS

	TEAM1 Rockstar Resort		TEAM2 Seascape Hotel		TEAM3 ecostar		TEAM4 Serenity		TEAM5 The Kask		TEAM6 Le Sable		TEAM7 Coastal Resort	
	Average	Rank	Average	Rank	Average	Rank	Average	Rank	Average	Rank	Average	Rank	Average	Rank
OPERATIONS:														
REVPAR $	42.55	6	51.61	3	49.34	5	70.59	1	56.45	2	51.33	4	33.44	7
Gross Operating Profit (IBFC %)	26.36	5	17.52	6	39.59	2	39.02	3	28.63	4	41.18	1	10.95	7
Rooms Market Share %	7.17	6	9.00	3	7.78	5	10.59	1	9.34	2	7.80	4	4.54	7
OWNER:														
ROCE % - Pretax profit/Capital Employed	9.95	5	6.77	6	24.19	3	33.96	1	19.73	4	27.54	2	-3.79	7
GUEST:														
Guest Satisfaction Survey(%)	56	6	62	4	61	5	64	1	64	2	63	3	51	7
STAFF:														
Staff Satisfaction survey (%)	48	6	60	5	78	1	64	3	62	4	67	2	47	7
OVERALL RANKING		6		5		4		1		3		2		7

PERFORMANCE AT A GLANCE

	TEAM1 Rockstar Resort	TEAM2 Seascape Hotel	TEAM3 ecostar	TEAM4 Serenity	TEAM5 The Kask	TEAM6 Le Sable	TEAM7 Coastal Resort
FINANCES:							
Total Revenue ($)	6,402,597	7,921,909	8,017,415	11,054,288	9,166,824	8,681,591	5,077,886
Room Revenue ($)	3,824,297	4,593,270	4,431,426	6,244,116	5,020,433	4,581,311	3,014,361
Income Before Fixed Costs,IBFC ($)	1,687,516	1,387,866	3,174,213	4,313,811	2,624,688	3,574,824	555,872
Income Before Fixed Costs (IBFC %)	26.4	17.5	39.6	39.0	28.6	41.2	10.9
Fixed Property & Equipment ($)	8,939,553	8,174,167	10,951,663	10,477,526	9,852,154	10,934,123	7,543,329
Working Capital ($)	-470,378	-48,294	-1,532,712	-331,978	-908,412	-1,219,128	72,930
EBITDA (earnings before interest, taxes & depn)($)	1,277,223	977,573	2,763,920	3,903,518	2,214,395	3,164,531	145,579
Profit before Taxes ($)	842,326	550,300	2,278,768	3,445,039	1,764,328	2,675,691	-288,761
Owners' Equity ($)	7,500,000	7,500,000	7,500,000	7,500,000	7,500,000	7,500,000	7,500,000
Income Tax Rate (%)	30	30	30	30	30	30	30
Income after Taxes ($)	697,568	385,210	1,595,138	2,411,527	1,235,030	1,872,984	-288,761
OPERATIONS:							
Average Daily rate ($)	110.83	103.58	112.24	112.90	108.00	108.04	130.70
Occupancy %	38.39	49.83	43.96	62.52	52.27	47.51	25.58

Source: revSIM, Michelle Huang, 2018

Oversight of individual results

OPTIMAL THEORETICAL MAXIMUM POSITIONS AT THE END OF THE GAME

ELLEN - FLOW
JOE - FLOW
LARRY - FLOW
REBECCA - CONTROL
CHRIS - RELAXATION
ALEX - CONTROL
JEN - AROUSAL

Source: Fligby, 2021

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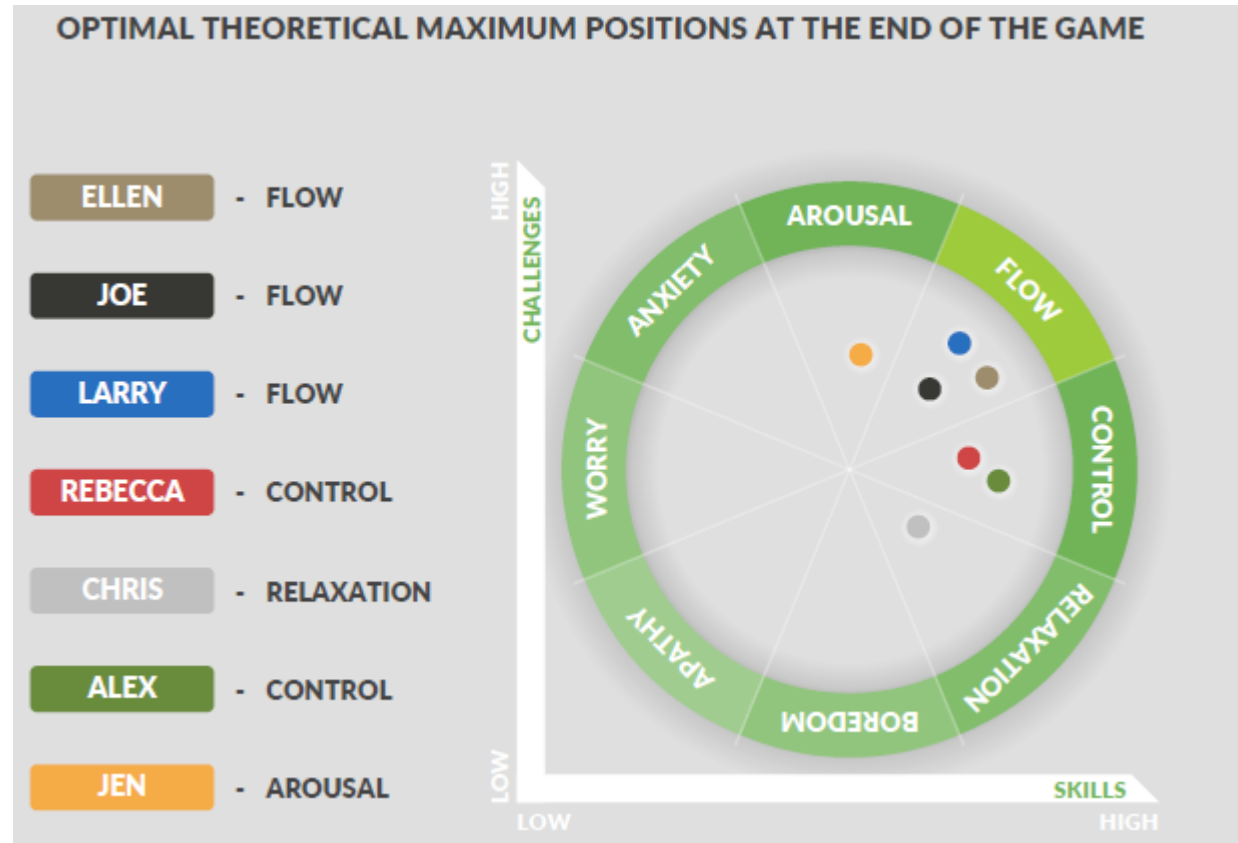
Authentic Assessment

- STTARR Model – excellent for written asynchronous assessment

ACRONYM	KEY ELEMENTS
Situation	The situation is the context in which the experience occurred. • What was the nature of the situation that made it "unique"?
Task	The task is what was actually required of you in the situation. • What did you have to do that was challenging?
Theory	The theory that helped you develop an appropriate action. • What insights from your studies helped you decide what to do?
Action	Action refers to the steps that you personally took to address the task. • What exactly did you do?
Result	Result refers to the outcome of your actions. • What were the results?
Reflection	When reflecting on your actions, ask yourself: • Why did you choose to respond in that particular way? • How did your actions contribute to the completion of the task? • How did your actions affect the final outcome of the situation? • What did you learn that was new? • Have you gained a deeper understanding of any particular issues? • What skills or abilities did you develop or improve as a result of the experience? • Can you use this new knowledge and personal insights in other situations? • How has this experience challenged what you knew? • How has this experience changed your attitudes towards yourself, your studies and your career? • Finally, what are you going to do about all of this?

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Authentic Assessment

- Socratic Dialogue (VIVA!) – perfect for synchronous and contemporaneous assessment

STAGE OF ENQUIRY	KEY ASSESSMENT ASSURANCE QUESTIONS: Did the student….	LEARNING OUTCOMES: The student has demonstrated required proficiency in…	What does this look like?
Procedural	• write a report in the format and style required? • use the specific software as required? • calculate the formula correctly?	technical skills.	Fairly simple, can the student do the functional operational tasks – especially in terms of numeracy. Can the student explain their work?
Theoretical	• employ the right theory or theories to address the challenge at hand? • appraise the evidence in light of our understanding of the theory?	the formal body of knowledge.	In doing the calculations above, was the student making use of theory? Can the student explain the theory used?
Conceptual	• analyse and manage the key concepts in the theory? • develop new insights	analysis and synthesis.	So, having picked the "right" theory, can the student demonstrate an understanding of the elements and concepts contained with the theory to: explain what has happened before and the develop strategy to manage/manipulate the concepts/constructs to achieve the desired outcome?
Philosophical	• locate the situation within a larger framework of competing interests, especially in terms of economic markets and human behaviour	policy.	Can the student demonstrate an understanding of the "social contract" – that entrepreneurs are entitled to make a profit, and customers are entitled to get value for money – how do we best balance the two in a truly sustainable manner?
Moral	• exercise judgment	ontology phronesis praxis & exegesis	So, the question is "how did the student land at this position?" – is the student simply following the rules, OR, are they starting to develop their own worldview based upon their own values?

Online Simulations: Scaffolding learning experiences with authentic assessment

Off The Shelf Simulators

HARVARD BUSINESS SCHOOL SIMULATIONS	PRICE per student US$
Cesim OnService: Small Service Business Management Simulation	39.99
Creating Your Life Simulation	10.00
Operations Management Simulation: Benihana V2	15.00
Cesim Hospitality: Hotel and Restaurant Management Simulation	39.99
Marketing Simulation: Customer Centricity	45.00
Leadership and Team Simulation: Everest V3	15.00
Innovation Simulation: Breaking News	10.00
Operations Management Simulation: System Utilization in Service Management	10.00
Entrepreneurship Simulation: The Startup Game	15.00
New Venture Simulation: The Food Truck Challenge	10.00

- Health – diagnosis
- Health – epidemiology
- Science – biology and life systems
- Engineering – manufacturing
- Project Management – SimCity + Minecraft
- Education – classroom management?

Online Simulations: Scaffolding learning experiences with authentic assessment

Lots of Resources

The following are from the online systems dynamic work I have led:

- https://www.tandfonline.com/doi/abs/10.1080/09669582.2020.1791892

- https://www.tandfonline.com/doi/abs/10.1080/10963758.2019.1685890

- https://link.springer.com/article/10.1007/s10734-018-0282-x

- https://search.informit.com.au/documentSummary;dn=414123491030081;res=IELBUS

- https://search.informit.com.au/documentSummary;dn=900021168254636;res=IELIAC

And this one is from an OLT funded Project. It is less about academic publications, and more about resources, to which all are most welcome: https://www.bizsims.edu.au/

At the end of the day….

It's just a tool to help you contrive customised and individualised data (the simulator churns out the data – but you make the decisions) by which your students can be engaged to learn and then demonstrate their mastery of the unit Intended Learning Outcomes.

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The Next Steps?

- Community of Practice
    - Applications Audit (who is doing what, where, when, how and why?)
    - Scholarship + Research + Publications

- Build Our Own
    - Pilot Project
    - Commercialisation.

Thanks for listening!

Questions

Image from https://depositphotos.com/

Let's Build Our Own

- Simulations need:
  - An underlying operating principle – C.U.T.E.
  - A setting / environment
  - Actors
  - A challenge for the actors
  - Data outputs, analytical tools, and decision inputs from the actors
  - A "simulation" of time given the decision inputs from the actors
- In practice, that means:
  - Engine
    - The system dynamic simulator (we buy and install that on a server)
  - Gears
    - The challenges confronting the student (we determine the complexity of the challenges for the students)
  - Skins
    - The setting and situation (we determine the situation in which the students find themselves.)

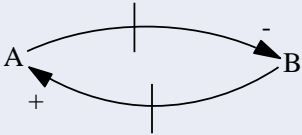And this is FORIO – which is the "off the shelf" engine that can be used to build a prototype.

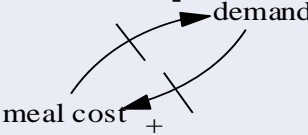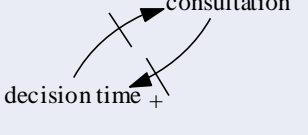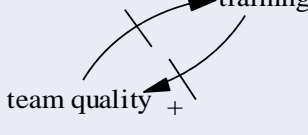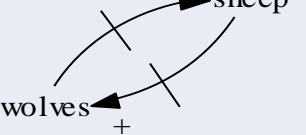And this is the Open Source System Dynamics Resource which we can be used in production.

Let's Build Our Own

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ELEMENTS		EXPLICATION	AQF 5 Diploma	AQF 6 Assoc. Degree	AQF 7 Bachelors	AQF 8 Grad. Cert.	AQF 8 Grad. Dip.	AQF 9 Masters
VARIABLES	Number	The number of variables starts small (two) and increases, but to no more than six, unless you are teaching systems theory to engineers!	2	3	4	5	5	6
	Linear	The relationship between the variables is simple and stable.	1	1	2	3	4	5
	Logarithmic	The relationship between the variables is complex, but stable.	0	0	1	1	3	5
	Quadratic	The relationship between the variables is complex and dynamic.	0	0	0	0	1	5
PROBLEMS	Tragedy of the Commons	Commonly shared resources can be exploited by one to the detriment of the whole.	0	0	2	3	3	5
	Unintended Consequences	Plans to fix one problem may create or exacerbate another problem.	0	1	2	3	4	5
	Tipping Points	A problem can get to the point wherein it "gets away from you" and can't be fixed.	0	0	0	1	3	5
	Wicked Problems	Some problems are such that moral judgments about harms and benefits and their impacts on others are required.	1	1	2	2	3	5
	Black Swans	Sometimes the unexpected happens (ie. COVID-19).	1	1	2	2	3	5

Online Simulations: Scaffolding learning experiences with authentic assessment

Let's Build Our Own

Variables	Explication	Generic	Hospitality	Management	Info Systems	Biology/Ecology
Model	We start with two variables.	Two variables with only one manipulated. A simple balanced loop.	Menu pricing.	Leadership and decision making.	Project management.	Wolf-sheep predation.
	In Model Format					
Relationships	The relationship between the variables is a simple linear relationship. As one variable increases, the other decreases and vice versa.	As A increases, B decreases and vice versa.	As meal cost increases, demand decreases and vice versa.	Increases in team consultation leads to better decision outcomes and vice versa.	Increases in team training leads to improved team quality and vice versa.	Increases in the number of sheep will lead to an increase in the number of wolves and vice versa.
Unintended consequences, tipping points, wicked problems	At AQF 5 we keep these simple and not too dramatic.	Nothing too dramatic but the delays can result in wild swings if users respond to variations too quickly.	Simulation users manipulate meal cost. Too conservative an approach will not maximise profits and erratic system behaviour can occur if actions are not driven by a plan.	In the short-term, a reduction in consultation will probably not impact on quality too much but a tipping point will be reached, and probably sooner rather than later.	As with leadership, a tipping point will be reached if training is gradually reduced over time.	By adding a link from sheep to grass (their food source), if the sheep population increases too much, some will starve through a lack of food.
Black swan	To "really throw" the students we can have a black swan event that hits everyone (i.e. COVID-19).	Dramatically change the variable not manipulated by the player some way into the game.	Dramatically increase or reduce demand well into the simulation eg. the 'Beer Game').	Introduce some external event that demands that decisions are made very quickly.	An economic downturn means that there is a glut of high-quality specialists available.	A prolonged drought occurs – or a disease ravages the sheep or wolf populations.