



Introduction to Technology Battles

I&E Basics/IBICT 2018

24th September 2018



What is a battle?





What is a battle?

- In essence, it is made of two elements:
 - Analysis of “real life” examples (aka Case study)
 - Competing innovations
 - Competing entrepreneurs
 - Ethical dilemmas
 - Scientific debates
 - ...
 - Through enacted dialectics (aka British Parliament model)



Case Studies





Case Studies

- Widespread methodology for education in business
- Used in MIT, Stanford, Harvard, Oxford, Cambridge...
- They combine
 - Induction (learning from examples)
 - Deduction (learning from theory)



Induction





Induction

- Learning from examples, creating generalizations
- In mathematics
 - Applied to natural numbers, it allows to prove that:
 - If a certain property is valid for the first number - a “base case” $n = 0$ or $n = 1$
 - And assuming that it is valid for n , the same property holds for $n+1$
 - Then it is valid for all natural numbers
- ...more concretely in our real life
 - Allows us to say that if something has always been a certain way, it will likely stay that way unless something external happens
 - I have seen the Sun rising every day, and always from the East
 - I have seen hundreds of swans in my life, and they're all white
 - I am alive today, so I'll be alive tomorrow..? (this might be problematic)



Induction fallacies

- Hasty induction leads to mistakes
- Take the statement from before:
 - I am alive today, so I'll be alive tomorrow
- The induction does not go on indefinitely, and we cannot know when it stops
- So we need to be conscientious about using induction
- We can combine induction with deduction



Deduction





Deduction

- Learning from theory, verifying (or better, falsifying) it in the world
- In philosophy, syllogisms:
 - If Socrates is a man
 - and if all men are mortal (notice this is induction!)
 - it logically follows that Socrates is mortal
- In science, theoretical physics, or cosmology
- Main problem: might take years, centuries, millennia to falsify a deduction...



British Parliament





https://www.youtube.com/watch?v=QnKKPwEX_ac



Why the British Parliament?





British Parliament

- Soft skills are part of the debate (and thus the class)
 - Leadership
 - Presentation
 - Public speaking
 - Negotiation
 - ...
- Also, these elements
 - Facts and fact-checking
 - Non-factual argumentation aka “b.s.”
 - Self-arbitration
 - Oversight from a neutral 3rd party



Why use battles to teach I&E?



Innovation





Innovation

- The debate structure shows how innovation is not “hard facts”, but the composition of many “soft” factors
- Learning is done through exploration rather than exploitation (see bibliography)
- If innovation is about being “out of the box” → We have to teach in out of the box ways



Entrepreneurship





Entrepreneurship

- The soft skills required to debate are the same that compose an entrepreneur's toolkit...
- But more than this, even just the organization of the battles requires you to be entrepreneurial



Open and closed debates





Open and closed debates

- Through battles, we analyze both “closed” debates (i.e., cases in which we already know who won) and “open” debates (i.e., matters that the society has not yet settled upon)
- Example of “closed” debates:
 - Is the Earth at the centre of the Universe?
 - Which is the superior plane between Boeing 747 and Concorde?
- Example of “open” debates:
 - Is copyright a good thing or a bad thing?
 - Does mass immigration help a country's economy?



Example: Star Wars

- We take the famous movie Star Wars
- We show how one storyline can be seen as an open or a closed debate
- This also has an impact on our reasoning
- How we perceive the debate changes how free we are to draw conclusions

Star Wars: Constructing a prequel



I



II



III



IV



V



VI





Retrospective reasoning

- This is how the Star Wars movies were filmed
- Ep. 4 starts “in medias res”, and does not resolve the main storyline
- By Ep. 6, the story is closed
- By setting the grounds in Ep. 1, the stories of Ep. 2 and 3 are “forced”
- This allows us to maintain internal coherence to the universe (i.e., Ep. 4-6)
- This is an example of retrospective reasoning, which is based on justification of previous actions

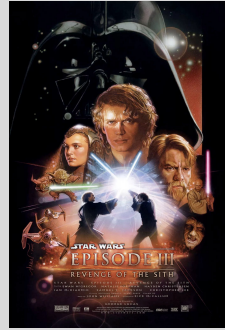
Star Wars: Constructing a sequel



I



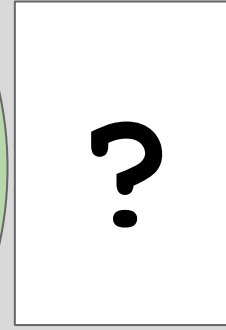
II



III



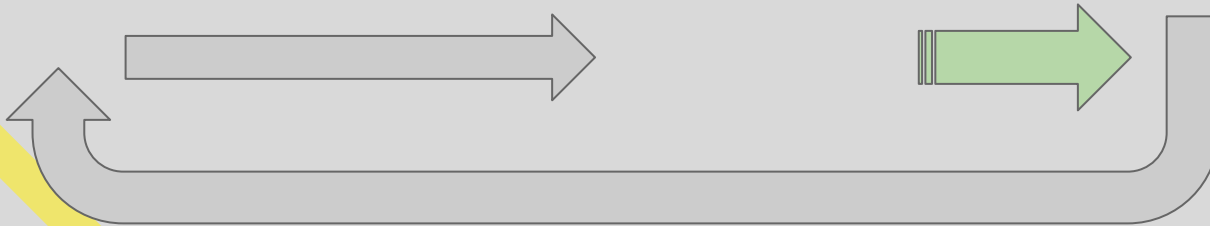
IV



V



VI





Prospective reasoning

- This is an alternative way to see the Star Wars universe
- Assume Lucas filmed Ep. 4, then went back to make the original trilogy
- How do Ep. 5 and 6 go?
- This is hard to reasonably guess, and represents an unexplored realm of possibility
- This exemplifies prospective reasoning, based on speculation, hypotheticals and a combination of induction and deduction



Retrospective vs prospective

- Each type of reasoning naturally work better with open or closed debates
-
- To go deeper in the concept, we will compare them directly

Retrospective vs prospective

given the current state of the world, how did we get here?

Retrospective case studies



GIVEN AN ALTERNATE BEGINNING, HOW COULD IT END?

Prospective case studies



Retrospective reasoning



Goal: Retrospectively find answers



Prospective reasoning



Goal: Create questions; affect final result



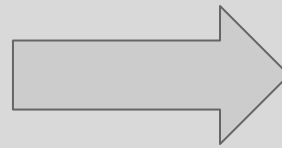
The class framework

- We have seen the two “modes” in which we can conduct case studies, but how do these interact with the British Parliament model?
- Most of all, this requires to change the core framework of the class...

Regular classes vs Battles



Unequivocality
Factuality
Conflict Avoidance



Equivocal Ambiguity
Counterfactuals
Controlled Conflict

Regular classes

Battles



Who wins a battle?





And the winner is...

- We are in the British Parliament, which allows direct confrontation
- The winner is found during the debate, not several years after
- We don't have the luxury of retrospective and hindsight
- Therefore, your goal is to be convincing, grounded, visionary
- The winner is the most **plausible**, not the most **right**



But what about the content?





Battle content

- Each battle has three main levels
- Horizontal content
 - Social/Economic context
 - Broader perspective
- Vertical content
 - Domain-specific content of the class
- Scenario (only for I&E Basics)
 - Usually a science fiction/fantasy story
 - Allows to abstract from the real world and explore more freely



Horizontal Content





Horizontal Content

- We call “horizontal” content those elements in the battle discussion that could be applied to any battle
- Examples of these are societal impacts, reflections on economic viability, ethical concerns...
- These go across battles, and allow to provide a coherent “context” throughout the course



Vertical Content





Vertical Content

- We call “vertical” content those elements specific to the debate in a battle
- Examples of these are comparisons of space tech in a battle on the 1960s/1970s “space race”, or of magnetic tapes in VHS vs Betamax
- These are isolated to one battle, and give the “core matter of fact” of each debate



Scenario

(mostly relevant to I&E Basics...)





Scenario

- Scenarios allow to abstract from history/state of the matter to have a broader vision of a topic
- Scenarios are *counterfactual*, and based on a “what if..?” question
- This allows to reopen closed debates
- An example of this is the rewriting of history (What if barbarians didn't invade Rome?) or alternate presents (What if tomorrow we were to get in contact with another civilization?)



Battle themes





Battle topics

- Steve Jobs vs Bill Gates
- Uber vs Taxis
- Realpolitik vs Ideology
- Tesla vs Edison
- Wikileaks good vs bad
- Concorde vs Boeing 747
- ...



“Dissecting” a battle

- Taking one of the above scenarios, here is how it is decomposed in the three elements
- Wikileaks good vs bad:
 - Scenario: A secret document is found that would invalidate the election of Angela Merkel in the 2018 elections. Should Wikileaks publish it, at the cost of jeopardizing the equilibrium of Europe?
 - Horizontal content: Social impact of politics
 - Vertical content: Security vs privacy debate; discussions about Wikileaks as a platform



Class flow





Battles as Blended Learning

- Battles are a Blended Learning methodology
- Each battle is done across three main moments:
 - Pre-class
 - Done by students and teachers before the battle itself
 - In-class
 - Actual run of the battle
 - Post-class
 - Follow-up to the class activity
- We will analyze each of them in the next slides...



Pre-Class





Pre-Class

- “Battle preparation”
 - Involves the two battle teams, the critical minds and the teachers
 - Each battle is introduced two weeks in advance
 - The meeting lasts ~1hr
 - Typical time: last part of the class (Mon ~5PM)
 - Teachers present the scenario and take questions
 - Students negotiate the “battleground” i.e., what is in and out of scope for discussion
 - Students prepare the battle autonomously



In-Class





In-Class - Anatomy of a Battle

- 10' per team → Opening statement
- 40' → Rebuttals, cross-examination, audience interventions
- 10' break
- 40' → More cross-examination
- 5' per team → Closing statement



Post-Class





Post-Class

— “Battle Report”

- “Word-like” document, around 10/12 pages
- Written jointly by the two opposing teams
- Summarizes scenario and theory background
- Explains each team’s point of view
- Finally, provides a reconciliation/conclusion
- Reconciliation is a synthesis → More than the sum of two parts!
- Template published around Nov 1st



In short

- Battles are **case studies** based on **debates**
- Debates can be **retrospective** or **prospective**
- Focus is on **plausibility** over facts-of-the-matter
- Content is both **horizontal** and **vertical**
- Wrapping and abstraction is done through **scenarios**



What next for I&E Basics?

- Monday, Oct 1st from 13:30 to 17:30 in **A107**
- Topics:
 - Innovation Theory - "The environment"
 - Innovation Theory - Ambiguity, Sensemaking, Antifragility
 - Battle 1 preparation



What next for IBICT?

- Battle 1 preparation in 15 minutes for 1 hr
 - Invited: Group 1, Coaches from **both** IBICT and IEB
- Monday, Oct 8th from 13:30 to 17:30 in **A102**
- Topics:
 - Organizations
 - Battle 1 - Apple vs Microsoft
 - Battle 2 preparation



Bibliography

- Methodological introduction: Bonifacio, Angeli, Stoycheva; Enacting Divergent Learning Dynamics in Teamworking: The Case of Technology Battles; Proceedings of EduLearn 2017 <http://dx.doi.org/10.21125/edulearn.2017.2416>
- On open and closed debates: Latour; Science in Action; Harvard University Press 1987; Chapter 1
- On induction: <https://plato.stanford.edu/entries/induction-problem/>
- On exploration: March; Exploration and Exploitation in Organizational Learning; Organization Science, Vol. 2, No. 1 (1991); <https://doi.org/10.1287/orsc.2.1.71>



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