Technology and Globalization

Module Length: 7 hours

Overview

This module provides an introduction to the complex relationships between technology and globalization during the past century, with a special emphasis on the contemporary world. With common required readings as its foundation, this curriculum prompts students to consider how scholars think about technology. Several of the module's flexible units introduce students to influential innovations and prompt them to assess the causes and consequences—both positive and negative—of technologies related to global production and trade, war, and agriculture. Other units examine the dynamics behind technological innovation, geopolitical and environmental factors related to global demand for oil, and the environmental and public health consequences of energy and technology-intensive globalization.

Module Learning Objectives

Through the completion of this module, participants will be able to:

1. Examine the dynamics behind technological innovation and globalization
2. Evaluate the geopolitical, social and environmental consequences of technology on society
3. Compare and contrast the historical and present-day impact of technology on trade and communications

Key Terms and Concepts

Internalist perspective of technology: reconstruct the history of machines and processes focusing on the role of the inventor, laboratory practices, and the state of scientific knowledge at a particular time. They chart the sequence that leads from one physical object to the next…They try to understand technology from the point of view from those who encounter them in a particular time and place. (Nye)

Dell Theory of Conflict Prevention: No two countries that are both part of a major global supply chain, like Dell's, will ever fight a war against each other as long as they are both part of the same global supply chain (Friedman)

Contextualist perspective of technology: focuses on how the larger society shapes and chooses machines. It is impossible to separate the technical and cultural factors when accounting for which technology wins the largest market share. (Nye)

"**Just-in-time**:" "It originally referred to the production of goods to meet customer demand exactly, in time, quality and quantity, whether the `customer' is the final purchaser of the product or another process further along the production line. It has now come to mean producing with minimum waste. "Waste" is taken in its most general sense and includes time and resources as well as materials."[1]

Technology Leapfrogging: the bypassing of technological stages that others (other countries) have gone through.[2]

Social constructivism: Technology is influenced by society. Social factors contribute to the success or failure of technology

Socio-cognitive model of technological development: Interactions between beliefs, artifacts, and evaluation routines lead to the creation of alternative technological paths.

Supply chain: Each step in the production process is now like one link in a flexible chain, which is hooked to the next piece, then to the next and so on.

Technological Determinism: technology shapes how we as individuals in a society think, feel, act, and how society operates as we move from one technological age to another (Marshall Mcluhan)

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[1] JIT Just-in-Time manufacturing. (n.d.) Retrieved from: http://www.ifm.eng.cam.ac.uk/dstools/process/jit.html
[2] Technology Leapfrogging. (n.d.) Retrieved from: http://www.ictregulationtoolkit.org/en/Section.1829.html

Technological Momentum: when a technology is new, social factors play an important role it its development and adoption. However, once a technology becomes widely accepted and used, social factors are less important. This theory is viewed by some as a form of social constructivism, others view this theory as an intermediate between social constructivism and technological determinism. (Thomas P. Hughes)

Technological system: consists of the various physical parts of the technology and the network of political, social, and economic relationships and forces that control and shape the technology (Thomas P. Hughes)

Techno-globalist: View the world as a global village. Nations are about to disappear through the advance of globalizing new technologies (Edgerton)

Techno-nationalist: the key unit of analysis of technology is the nation state. Nations are the unit that invents. They have research and development budgets, culture of innovation that diffuse and use technology. (Edgerton)

Technological system: "A piece of technology does not exist in a social vacuum, but is connected with makers, users, and other technologies in often complex ways" (McClellan and Dorn)

Technology Innovation: the development of new knowledge, products, or processes, and government-oriented technology transfer

Technology Diffusion: dissemination of technical information and know-how and the subsequent adoption of new technologies and techniques by users.

World Wide Computer: there is a shift taking place from computing taking place on personal computers to the Internet. The World Wide Web is turning into a worldwide computer. For example, people use online software, do their taxes online, store files online, etc. (Carr)

Lesson Plans

Lesson 1: Introduction- Thinking about Technology in the Modern World

Overview

Students examine many of the most influential technologies of the past century. They explore how scholars examine technology and identify the broader historical causes and effects of technological development.

Relevant Learning Objectives

1. Examine the dynamics behind technological innovation and globalization

Procedure

Possible Classroom Activities

- Interdisciplinary Discussion: Module Hook.
  (Time: 15 minutes)(Skills: Holistic Thinking) (Objective 1)(Related Resources: n/a)

  The instructor asks the students to compare and contrast how historians, anthropologists, sociologists, business scholars define technology's role in society

  History: Technologies are social constructions. "[Technology is] the sum of the methods by which a social group provides itself with the material objects of their civilization"[3]

  Anthropology: Technologies are cultural construction. "What is technology? Is technology a human universal? What is the relationship between technological development and cultural evolution? Are there common themes in the appropriation of artifacts that bridge capitalist and precapitalist societies? How do people employ artifacts to accomplish social purposes in the course of everyday life? What kind of cultural meanings is embodied in technological artifacts? How does culture influence technological innovation – and how does technological innovation influence culture? These questions are far from trivial and only, arguably, on anthropology can answer them"[4]

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[3] Historical Perspectives on Technology, Culture, and Society. (n.d.). Retrieved from:
http://www.historyoftechnology.org/booklets.html

[4] Pfaffenberger, Bryan. (1992). Social Anthropology of Technology. *Annu Rev Anthropol,* 491-516. Retrieved from:
http://www.jstor.org/stable/2155997?seq=1

Sociology: Technologies are embedded in everyday life. "First, understanding the place of these new technologies from a sociological perspective requires avoiding a purely technological interpretation and recognizing the embeddedness and the variable outcomes of these technologies for different social orders. These technologies can indeed be constitutive of new social dynamics, but they can also be derivative or merely reproduce older conditions."[5]

Business: Technology is utilitarian. Technology is: "The purposeful application of information in the design, production, and utilization of goods and services, and in the organization of human activities."[6]

Sciences: Science depends on technologies. (by Wanda by David Landes)

- Discussion on Nye Reading.
  (Time: 20 minutes)(Skills: Holistic Thinking) (Objective 1)(Related Resources: Nye reading)

  What determines the success of a technology in a given period of time? Discussions can take place in small groups amongst students or facilitating by the professor.

  According to David Nye, if technologies do not develop "naturally," seamlessly flowing out of and replacing others, then what gives a particular technology "momentum" and a possibility of wide-scale acceptance? How do "internalist" and "contextualist" analyses of technology help observers understand the success or failure of particular technologies?

- Technology in our Daily Lives: Cross-cultural Communications Activity.
  (Time: 40 minutes)(Skills: Holistic Thinking) (Objective 1)(Related Resources: Appendix A)

  Students research another culture. They interview someone from that culture to learn about how they use information communications technology. Appendix A contains the relevant research questions. Students give a brief presentation in class on what they have learned.

  Please note this activity will need to be introduced to the students ahead of time, as students will need time to research the culture, conduct the interviews, and prepare their findings. Classroom time can be used for the presentations of the findings.

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[5]Sassen, Saskia. (May 2002) Towards a Sociology of Information Technology. *Current Sociology.* vol. 50 no. 3 365-388.
[6] Technology. (n.d.) In Business Dictionary.com. Retrieved from:
http://www.businessdictionary.com/definition/technology.html

- Timeline of the Future.
  (Time: 20 minutes)(Skills: Holistic Thinking) (Objective 1)(Related Resources: http://www.futuretimeline.net/index.htm)

  The students visit http://www.futuretimeline.net/. They should choose three projected events and decide whether they agree or disagree with the prognosis and why. What past or recent technological developments contributed to this future event? In groups, develop a prediction. The class should vote on the best prediction and send it to the site.

- Social Media Wiki.
  (Time: 20 minutes)(Skills: Holistic Thinking) (Objective 1)(Related Resources: http://pbworks.com/, wikispace.com)

  Each student or teams of students are responsible for developing one page in a classroom wiki. Students should write about one emerging social media tool, such as Facebook, LinkedIn, Twitter, or others. The focus of the article should be how this media is innovative and why. This activity helps students understand the limitations of wikis and gives students the practice of collaborating to develop an online project.

Resources

- Appendix A
- Future Timeline of Technology. (2011, May 9). Retrieved from: http://www.futuretimeline.net/
- Nye, David. (2006). How Do Historians Understand Technology?, *Technology Matters: Questions to Live With*, 49-66. Retrieved from: http://www.scribd.com/doc/35985191/Technology-Matters-Questions-to-Live-With-by-David-E-Nye

Lesson 2: Technologies of Industrial-Age and 21st Century Production, Trade, and Communication

Overview

Students examine technologies that helped engender new, often revolutionary forms of regional and global production, trade, and communications in the late 19th and early 20th centuries and in the last few decades.

Relevant Learning Objectives

3. Compare and contrast the historical and present-day impact of technology on trade and communications

Procedure

Possible Classroom Activities:

- Introductory Activity.
  (Time: 5-7 minutes)(Skills: Holistic Thinking) (Objective 3)(Related Resources: n/a)

  Ask the students to identify technologies that they use in everyday life and guess when they were invented?

  Common answers: eyeglasses (1280), pocket watch (1510), pressure cooker (1679), electric motor (1821), lawn mower (1830), refrigerator (1834), type writer (1843), microphone (1877), motor cycle & first automobile to use diesel(1885), radio signal (1895), vacuum cleaners (1901), mass production of model T (1908), toasters (1909), washing machine (1910), 1923 (electronic television), ballpoint pen (1938), microwave oven (1946), ATM (1967), World Wide Web (1990)[7]

- Lecture and Discussion on Industrialization.
  (Time: 20 minutes)(Skills: Holistic Thinking) (Objective 3)(Related Resources: McClellan and Dorn, Headrick and Bernstein readings, Powerpoint: Lesson-2-Industrial-Age-21st-Century-Production)

  Trace the impact of 20th century technologies on work and home-life and industrialization. This activity can be done in a frontal style or in small group discussions. Students could read one of the readings and then contribute to the group discussion based on that reading.

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[7] "Technology Timeline." Retrieved from: http://www.history-timelines.org.uk/events-timelines/12-technology-timeline.htm

Key questions and themes:

What do James McClellan and Harold Dorn identify as defining technologies of the 20th century, and how have they influenced home and work life in developed societies and relationships among them and less developed nations during this period?

What does Daniel Headrick identify as transformative technologies in the late 19th and early 20th centuries? How did those technologies affect work and home life, military power, and industrialization in countries around the world?

According to William Bernstein, how did steam, steel, and refrigeration trigger global trade revolutions on land and water in the late 19th century

- Discussion on Global Production.
  (Time: 15 minutes)(Skills: Holistic Thinking) (Objective 3)(Related Resources: Meredith, Lynn, Friedman reading)

  Before class, divide the classroom into small groups of students. Each student in the group should read one of the articles. The 2nd Friedman reading about Dell, does not have to be assigned, but can be brought into the class discussion. The group should create a chart comparing old vs. new assembly models of manufacturing. The charts should be brought to the class for the discussion. In class, discuss the impact of the new models.

  This activity can be done in a frontal style or in small group discussions. Students could read one of the readings and then contribute to the group discussion based on that reading.

  Guiding questions:
  o How does the global "disassembly line" of the 21st century work, according to Robyn Meredith, and how does it differ from industrial assembly line production pioneered in the early 20th century? Why did this system of transnational industrial manufacturing recently emerge?
  o What does Barry Lynn identify as the benefits and the potential hazards of global lean manufacturing and outsourcing (Meredith's "disassembly line") for America's economy and foreign policy?
  o What does Thomas Friedman mean when he says the world is "flat?" What technologies have made this global economic system possible?
  o In Thomas Friedman's story, how does Dell computer illustrate the workings of a global supply chain linking "just-in-time" manufacturers around the world? What is his "Dell Theory of Conflict Prevention?"

- Lecture and Discussion on Communications Technologies.
  (Time: 20 minutes)(Skills: Holistic Thinking) (Objective 3)(Related Resources: Micklethwait and Wooldridge, and Carr reading)

  Compare and contrast the positive and negative outcomes of communications technologies. This activity can be done in a frontal style or in small group discussions. Students could read one of the readings and then contribute to the group discussion based on that reading.

  Mickelwait and Woolridge's claim that "technology is freedom": Computer, telephonic, and wireless communication technologies have changed the ways of work and doing business around the world. Internet and cell phones have contributed to the death of distance. People are no longer constrained by space; they can connect to people and products from around the world. People can do business without ever leaving their own front door. Wireless technologies have revolutionized the developing world as countries are skipping installing landlines and are going straight to wireless phones. Farmers no longer need middlemen to find out the value of their crops.[8] *Does technology really bring freedom? Can technology enslave as well?*

  Nicholas Carr: Machine" of the Internet have turned into a "utility-computing grid" whose digital applications, tapped from off-site servers, can help people and enterprises around the world power their businesses. There is a shift taking place from computing taking place on personal computers to the Internet. The World Wide Web is turning into a worldwide computer.[9] For example, people do their taxes online, store files online, etc. *What are the moral implications of having people's personal information being available on the Internet, and mined by marketing and advertising firms.*

- Walmart Activity.
  (Time: 10 - 60 minutes)(Skills: Holistic Thinking) (Objective 3)(Related Resources: *Is Walmart Good for America* and Appendix B: Is Walmart Good for America Question Sheet)

  In class, watch the documentary on Walmart and discuss how modern technologies and business practices have facilitated new trade relationships between the U.S. and China as well as new dynamics between industrial manufacturers and product retailers. The

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[8] Micklethwait, John and Wooldridge, Adrian. "Technology as Freedom," *A Future Perfect: The Challenge and Hidden Promise of Globalization* (Crown Business, 2000), 29-45

[9] Carr, Nicholas. "World Wide Computer," *The Big Switch: Rewiring the World, From Edison to Google* (W.W. Norton, 2008), 107-125.

instructor can show the full movie or select the sections that relate to his or her class.

- Discussion on Schroeder Article.
  (Time: 10 minutes)(Skills: Holistic Thinking) (Objective 3)(Related Resources: Schroeder reading)

  Discuss the following points from the Schroeder article

  - o Cords, plugs and receptacles developed along with lighting technology circa 1882
  - o Manufacturers demonstrated these technologies at Chicago's World's Fair 1892
  - o Little advertising or promotion of domestic appliances before 20th century
  - o Problem: No consensus on where receptacles should be (in ceiling? On walls?) and no consensus on shape of plugs and receptacles (two parallel blades or some other configuration?)
  - o Result: Consumers rejecting new appliances for fear of hassle involved in using them
  - o 1917 – 6 manufacturers agree on two parallel blades/huge growth in market
  - o 1962 – agreement on grounding plug
  - o What is the significance of having standards in electronics?

- Reflection.
  (Time: 5 minutes)(Skills: Holistic Thinking) (Objective 3)(Related Resources: n/a)

  The instructor asks the students. Which article provided you with a new perspective on the role of technology in history or in your lives today and why?

Resources

- Appendix B: Is Walmart Good for America Question Sheet
- Bernstein, William. (2008). What Henry Bessemer Wrought. In *A Splendid Exchange: How Trade Shaped the World* (324-337). New York: Atlantic Monthly Press.
- Carr, Nicholas. (2008). World Wide Computer. In *The Big Switch: Rewiring the World, From Edison to Google* (107-125). New York: W.W. Norton.
- Friedman, Thomas. (2005, April 3). It's a Flat World, After All, *The New York Times.*
- Friedman, Thomas. (2005). The Dell Theory of Conflict Prevention. In *The World is Flat: A Brief History of the Twenty-First Century* (414-438). New York: Farrar, Straus and Giroux.
- Headerick, Daniel. (2009). The Acceleration of Change (1869-1939). In *Technology: A World History* (111-129). Oxford: Oxford University Press.
- *Is Walmart Good for America.* (2004). Retrieved from: http://www.pbs.org/wgbh/pages/frontline/shows/walmart/

- Lynn, Barry. (2002 June). Unmade in America: The True Cost of a Global Assembly Line, *Harper's Magazine*, 33-41. Retrieved from: http://www.barryclynn.com/wp-content/Harpers_Unmade.pdf
- McClellan, James III and Dorn, Harold. (2006). Toolmakers Take Command. In *Science, Technology in World History: An Introduction*, 2nd ed. (339-363). Baltimore: Johns Hopkins University Press. Retrieved from: http://www.docstoc.com/docs/58634626/Science-and-Technology-in-World-History
- Meredith, Robin. (2007, July 23). The Disassembly Line, *Forbes*. Retrieved from: http://www.forbes.com/2007/07/20/elephant-dragon-meredith-oped-cz_rm_0723dragonfour.html
- Micklethwait, John and Wooldridge, Adrian. (2001). Technology as Freedom. In *A Future Perfect: The Challenge and Hidden Promise of Globalization* (29-45). New York: Random House. Retrieved from: http://books.google.co.ls/books?id=iQUAoi2IQiwC&printsec=frontcover&hl=en&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false
- Powerpoint: Lesson-2-Industrial-Age-21st-Century-Production. Retrieved from: http://www.global-workforce.globalization101.org/wp-content/uploads/2012/05/Lesson-2-Industrial-Age-21st-Century-Production.pptx
- Schroeder, Fred E. H. (1986). More 'Small Things Forgotten': Domestic Electrical Plugs and Receptacles. *Technology and Culture,* 27 #3, 525-543.

Lesson 3: Technological Innovation and Global Competition

Overview

Students examine why some societies embrace technological development and how they successfully stimulate that innovation. Students identify the potential implications of a nation's failure to encourage technological innovation.

Relevant Learning Objectives

1. Examine the dynamics behind technological innovation and globalization

Procedure

Possible Classroom Activities:

- 2001: A Space Odyssey Recut: The Dawn of Man.
  (Time: 10 minutes)(Skills: Holistic Thinking) (Objective 1)(Related Resources: Youtube clip of the Dawn of Man)

  Start at 1:26 minutes into the clip.

  1) Summarize what just happened in this clip.
  2) Who are these creatures?
  3) What is the purpose of this opening as an introduction to a movie about a space exploration?
  4) You saw this opening, how it developed, what transpired, and the result: was the outcome inevitable? And if so, why?
  5) Has society since then changed? Why or why not?

- Lecture and Discussion on Emergence of Technologies.
  (Time: 15 minutes)(Skills: Holistic Thinking) (Objective 1)(Related Resources: Garud and Pappa reading and Lesson 3 Technology and Innovation Powerpoint)

  From a socio-cognitive perspective, examine the emergence of technologies. Lecture on PowerPoint slides 1-7. Please note these are complex ideas. Students will need time to grasp this perspective. One way for students to grasp this theory is to have them doodle the concepts while you are explaining, and then have the student share their doodles as a way to illustrate the concept. Another way to illustrate the point would be to refer back to 2001 space odyssey clip and ask students to explain the socio-cognitive perspective based on the sequence of events shown in the movie. At the end ask students to ponder how cognition relates to innovation.

- Lecture and Discussion on Technology Adoption.
  (Time: 30 minutes)(Skills: Holistic Thinking) (Objective 1)(Related Resources:
  Diamond, Buchanan or Edgerten readings and Lesson 3 Technology and Innovation
  PowerPoint)

  Compare and contrast theories on why some societies embrace technologies and are able
  to stimulate their development and others cannot (or do not). This activity can be done in
  a frontal style or in small group discussions. Students could read one of the readings and
  then contribute to the group discussion based on that reading. Please note the PowerPoint
  does not cover R.A. Buchanan's reading.

  - According to Jared Diamond, what are some common misunderstandings about
    the reasons some people and societies were more advanced technologically than
    other? How does Diamond account for the differences across time and in
    different societies in technological innovation and development?
  - According to R.A. Buchanan, how and why did western nation-states encourage
    technological innovation in modern history, especially as scientific research and
    technological development became more closely linked during the last century?
  - What does David Edgerton identify as weaknesses of the "techno-nationalist"
    account of technological development? How have multinational businesses and
    political empires facilitated the spread of technology?

- Case Study and Discussion on Chinese Innovation.
  (Time: 15 minutes)(Skills: Holistic Thinking) (Objective 1)(Related Resources: Shenkar
  reading and Notes on China blog)

  Examine the role of the Chinese government in stimulating innovation. This activity can
  be done in a frontal style or in small group discussions. Students could read one of the
  readings and then contribute to the group discussion based on that reading.

  What does Oded Shenkar identify as path breaking fields of scientific research and
  technological development currently pursued by Chinese authorities? Why are they
  aiming to make China a technological pace setter rather than imitator?

- Discussion on Patents and Innovation
  (Time: 20 minutes)(Skills: Holistic Thinking) (Objective 1)(Related Resources: Enriquez
  and Stiglitz readings)

  Discuss the role of patents in encouraging innovation and technological development.
  Enriquez and Stiglitz pieces offer competing perspectives. This activity can be done in a
  frontal style or in small group discussions. Students could read one of the readings and

then contribute to the group discussion based on that reading.

Patents aim to foster innovation in the private sector by allowing inventors to profit from their inventions. Yet patents can restrict access to vital medicines or impede development of new technologies that are improvements to existing technologies.

Key question from the readings:
How do 21st century genetic engineering techniques, in Juan Enriquez's account, promise to revolutionize agriculture around the world? How and why should nations position themselves to be innovators rather than just users of patented genetic agricultural technology?

What does Joseph Stiglitz suggest are the adverse consequences of poorly designed intellectual property regimes, and what would constitute balanced regimes that stimulate innovation and enable people throughout the world to access life-saving technologies?

- Discussion on the Evolution of Technology.
  (Time: 15 minutes)(Skills: Holistic Thinking) (Objective 1)(Related Resources: Adner and Leventhall reading and Lesson 3 Technology and Innovation PowerPoint)

  Examine the role of demand in the evolution of technology. How does this theory of demand compare to other innovation factors (patents, government policy, culture, etc..) This activity can be done in a frontal style or in small group discussions. Students could read one of the readings and then contribute to the group discussion based on that reading.

- Reflection
  (Time: 10 minutes)(Skills: Holistic Thinking) (Objective 1)(Related Resources: n/a)

  Compare and contrast how different players and policies contribute to the evolution of technology: entrepreneurs, firms/companies, audience/ end users, governments

Resources

- 2001: A Space Odyssey Recut: The Dawn of Man. (April 2, 2010). Retrieved from: http://www.youtube.com/watch?v=l9E4f0AanBE
- Adner, Ron and Levinthal, Daniel. (2001 May). Demand Heterogeneity and Technology Evolution: Implications for Product and Process Innovation. In *Management Science,* 47 #5, 611-628.
- Buchanan, R.A. (1992). Technology and the State. In *The Power of the Machine: The Impact of Technology From 1700 to the Present* (216-235). New York: Penguin Books, 1992.

- Diamond, Jared (1999). Necessity's Mother: The Evolution of Technology. In *Guns, Germs, and Steel: The Fate of Human Societies.* (239-264). New York: W.W. Norton & Co.
- Edgerton, David. (2007). Nations. In *The Shock of the Old: Technology and Global History Since 1900* (103-137). New York: Oxford University Press.
- Enriquez, Juan. (2001). Technology, Gene Research, and National Competitiveness, in Solbrig, Otto et al. eds. *Globalization and the Rural Environment.* (225-254). Cambridge: Harvard University Press.
- Garud, Raghu and Pappa, Michael A. (1994 August). A Socio-Cognitive Model of Technology Evolution: the Case of Cochlear Implants. In *Organizational Science*, 5 #3, 344-362. Retrieved from: http://www.archive.org/details/sociocognitivemo00garu.
- Shenkar, Oded. (2006, January 19).Learning from China's Export Boom. In *Bloomberg Business Week.* Retrieved from: http://www.businessweek.com/technology/content/jan2006/tc20060119_322122.htm
- Stiglitz, Joseph. (2006) Patents, Profits, and People. In *Making Globalization Work* (103-132). New York: W.W. Norton.

Lesson 4: Tools of Military Power and Prestige

Overview

Students identify how new technologies influenced weaponry, tactics, and strategies of war have sometimes facilitated or inhibited globalization since the late 19th century.

Relevant Learning Objectives

2. Evaluate the geopolitical, social and environmental consequences of technology on society

Procedure

Possible Classroom Activities:

- Introduction.
  (Time: 5 minutes)(Skills: Holistic Thinking) (Objective 2)(Related Resources:)

  What technologies do you use that initially came from the military? Would these innovations happen absent of war?

  Potential answers: nuclear power, Internet, Velcro, microwave ovens, GPS, communication satellites, SUVs, sonar (to name a few)

- Lecture and Discussion on Technology and Military Power.
  (Time: 20 minutes)(Skills: Holistic Thinking) (Objective 2)(Related Resources: Curtin and Friedel reading, Technology and War PowerPoint)

  Compare and contrast readings and perspectives on technology and military power during the early 19th and 20th century. This activity can be done in a frontal style or in small group discussions. Students could read one of the readings and then contribute to the group discussion based on that reading.

  Questions from the Readings:
  - What organizational and technological advantages does Philip Curtin identify as key to European military power in the 19th and early 20th centuries, and how was that power exerted around the world?
  - According to Robert Friedel, in what ways did the relationship between war, technology, and technological innovation change during the 19th century? What

were some of the transformative tools of war during that time?

- Lecture and Discussion on Technology's Influence on War.
  (Time: 20 minutes)(Skills: Holistic Thinking) (Objective 2)(Related Resources: Van
  Creveld and Boot readings, Technology and War Powerpoint, New Army Technology
  video, Robot Wars - Worrying New World Technology for 21st Century Modern
  Warfare - War Of The Machines video)

  Compare and contrast readings and perspectives on technologies' influence on war, post-
  World War II. Supplement the discussion with the Youtube videos. This activity can be
  done in a frontal style or in small group discussions. Students could read one of the
  readings and then contribute to the group discussion based on that reading.

  - o According to Martin Van Creveld, how have modern military technologies
      influenced the course of "conventional" wars since World War II, and how have
      those technologies simultaneously enabled the rise of insurgencies, guerrilla
      wars, and terrorist attacks around the world?
  - o What advances in technologies, according to Boot, has given the U.S. supremacy
      in the battlefield. What tools used by insurgents can counteract U.S. military
      might?
  - o Moral question: How does today's technology, i.e. drones and robots, change the
      morality of war?

- Research Activity.
  (Time: 20 minutes)(Skills: Holistic Thinking and Technology skills) (Objective
  3)(Related Resources: n/a)

  Students (individually or in small groups) conduct online research and then present in
  class and/or in a short essay an analysis of how some weapon has been recently
  implicated in or may soon influence some regional or global conflict (e.g. land mines in
  East Asia; nuclear weapons in North Korea, Iran, or India and Pakistan; I.E.D.s and Iraq
  and Afghanistan; cyber-attack; poison gas and Iraq-Iran War; biological weapons and
  terrorism; small arms and war in northern Uganda or Congo).

- Discussion on Multiple Readings.
  (Time: 30 minutes)(Skills: Holistic Thinking) (Objective 3)(Related Resources: Hain,
  Squaassoni or Forden readings)

  Small groups of students read one of the following three selections (Hain, Squaassoni or
  Forden readings) and present the author's accounts to the class. Teacher facilitates
  discussion comparing and contrasting the different authors

- Online Simulation of Trench Warfare.

  (Time: 20 minutes)(Skills: Technology Skills) (Objective 3)(Related Resources: http://www.bbc.co.uk/schools/worldwarone/hq/games.shtml)

  This is an excellent tool to understand limitations of weapons during World War I.

- Discussion on the Origins of the Internet.
  (Time: 15 minutes)(Skills: Holistic Thinking) (Objective 3)(Related Resources: Denning Reading)

  Guiding Questions: What are the origins of the Internet? How does the technology work? How has the functionality and use of this technology changed in the past 40 years? What is so revolutionary about this technology?

Resources

- Boot, Max. (Fall 2006). The Paradox of Military Technology. In *The New Atlantis*. Retrieved from: http://www.thenewatlantis.com/publications/the-paradox-of-military-technology.
- Curtin, Philip. (2000). Technology and Power. In *The World & the West: The European Challenge and the Overseas Response in the Age of Empire.* (19-37). New York: Cambridge University Press.
- Denning, Peter J. (Nov-Dec 1989). The ARPANET after Twenty Years. In *American Scientist* 77, 530-535.
- Friedel, Robert. (2007). The Improvement of Violence. In *The Culture of Improvement: Technology and the Western Millennium* (363-383). Boston: MIT Press.
- Forden, Geoffrey. (January 2007). How the World's Most Underdeveloped Nations Get the World's Most Dangerous Weapons. In *Technology & Culture* v. 48, n. 1, 92-103.
- Hain, Raymond. (1999, August 13). The Use and Abuse of Technology in Insurgent Warfare. In *Air and Space Journal*. Retrieved from: http://www.airpower.maxwell.af.mil/airchronicles/cc/Hain.html.
- New Army Technology (February 15, 2007). Retrieved from: http://www.youtube.com/watch?v=sNuQaAGWMts&feature=related
- Robot Wars - Worrying New World Technology for 21st Century Modern Warfare - War Of The Machines. (May 9, 2011). Retrieved from: http://www.youtube.com/watch?v=e2AZDO4lDjw
- Squassoni. Sharon. (2005, February 17). Indian and Pakistani Nuclear Weapons. Retrieved from: http://www.ndu.edu/library/docs/crs/crs_rs21237_17feb05.pdf.
- Trench Warfare Game. (n.d.) Retrieved from: http://www.bbc.co.uk/schools/worldwarone/hq/games.shtml

- Van Creveld, Martin. (1989). Real War. In *Technology and War: From 2000 B.C. to the Present* (297-310). New York: The Free Press.

Alternative Web-Accessible Resources

- Bumiller, Elisabeth and Shanker, Thom. (2011, June 19). War Evolves With Drones, Some Tiny as Bugs. In *The New York Times*. Retrieved from: http://www.nytimes.com/2011/06/20/world/20drones.html?_r=4&pagewanted=1&adxnnl=1 &adxnnlx=1308931228-1X0W5ltjLS27jlm4h2X3ag
- Roland, Alex. (2009 February). War and Technology. In *Newsletter of the Foreign Policy Research Institute,* Vol 14. No. 2. Retrieved from: http://www.fpri.org/footnotes/1402.200902.roland.wartechnology.html

Lesson 5: Agricultural Technologies and Techniques

Overview

Students identify many of the characteristics of modern, high-tech agriculture and debate the relative costs and benefits of that global system of food production and processing.

Relevant Learning Objectives

2. Evaluate the geopolitical, social and environmental consequences of technology on society

Procedure

Possible Classroom Activities:

- Introductory Activity.
  (Time: 5-7 minutes)(Skills: Holistic Thinking) (Objective 2)(Related Resource: n/a)
  What did you have for lunch? Where did it come from?

- Discussion on the Green Revolution.
  (Time: 15 minutes)(Skills: Holistic Thinking) (Objective 2)(Related Resource: Easterbrook, Patel, and Anand readings)

  Debate the benefits and detriments of the "Green Revolution" in agriculture. This activity can be done in a frontal style or in small group discussions. Students could read one of the readings and then contribute to the group discussion based on that reading

  What does Gregg Easterbrook praise as the achievements of agronomist Norman Borlaug and his so-called "Green Revolution?" What positive role may new agricultural techniques play around the world?

  What critiques does Raj Patel have of the "Green Revolution"? Has Africa learned from past mistakes, what is the continent doing differently in implementing its own "Green Revolution"?

  According to Geeta Anand, what were its adverse effects of the "Green Revolution" on Indian society and agriculture? Who stands to gain from the new revolution and what better alternative model of agriculture does he embrace?

- Discussion on the Impact of Technology on Food Production in the U.S.
  (Time: 15 minutes:)(Skills: Holistic Thinking) (Objective 2)(Related Resources: Pollan and Blake reading)

Students examine Pollan's perspective on agri-business and food production and Blake's critique. This activity can be done in a frontal style or in small group discussions. Students could read one of the readings and then contribute to the group discussion based on that reading.

According Michael Pollan, what technologies and government policies account for the relatively low cost of food in much of the world, and what are their negative effects on small producers and on the natural environment across the globe? What does he recommend to solve the problem?

Student should compare and contract Pollan's Blake's argument on agri-businesses and the current food system in the U.S.

- Case study: Agribusiness in Brazil.
  (Time: 45-60 minutes)(Skills: Cross-cultural Communications and Holistic Thinking) (Objective 2)(Related Resources: Appendix C)

  Students examine agriculture/agri-business from different perspectives

- Agriculture Video Activity.
  (Time: 24 – 90 minutes)(Skills: Holistic Thinking) (Objectives 2)(Related Resources: Hungry for Profit, Future of Food or Food Inc films)

  Watch one of the following documentary films and discuss its claims about the effects of modern agriculture in the United States and/or abroad.

- Historical Agriculture Video Activity.
  (Time: 15 – 27 minutes)(Skills: Holistic Thinking) (Objectives 2)(Related Resources: Fundo in Chile or Democracy at Work or Man on the Land or Agriculture USA films)

  Watch one of the following online historical videos and discuss how it promoted technology-intensive agriculture for development in the U.S. or abroad, and consider how indigenous farmers in the US and/or other countries would have regarded its message.

- Reflection.
  (Time: 10 minutes)(Skills: Holistic Thinking) (Objective 2)(Related Resources: n/a)

  Compare and contrast how different players and policies contribute to the global food supply.

Resources

- *Agriculture USA*. (1962). United States: U.S.D.A. Video. Retrieved from: http://www.archive.org/details/prelinger [27 min]
- Anand, Geeta. (2010, February 22). Green Revolution in India Wilts as Subsidies Backfire. In *The Wall Street Journal*. Retrieved from: http://online.wsj.com/article/SB10001424052748703615904575052921612723844.html
- Appendix C
- Bryan, Julien. (1949). *Fundo in Chile*. United States: U.S. Office of the Coordinator of Inter-American Affairs. Retrieved from: http://www.archive.org/details/prelinger [20 minutes]
- *Democracy at Work in Rural Puerto Rico*. (1940) United States: U.S.D.A. Video. Retrieved from: http://www.archive.org/details/prelinger [19 min]
- Easterbrook, Gregg. (1999 January).The Forgotten Benefactor of Humanity. In *The Atlantic*. Retrieved from: http://www.theatlantic.com/doc/199901/green-revolution
- Garcia, Deborah Koons (Producer). (2004). *The Future of Food*. United States: Lily Films Retrieved from: http://www.thefutureoffood.com/onlinevideo.html [90 min]
- Hurst, Blake. (2009, July 30). The Omnivore's Delusion: Against the Agri-intellectuals. In *The American*. Retrieved from: http://www.american.com/archive/2009/july/the-omnivore2019s-delusion-against-the-agri-intellectuals
- Kenner, Robert (Producer). *Food, Inc.*. (2009). United States: PBS. http://www.foodincmovie.com/ [24 min]
- *Man on the Land*. (1951) United States: American Petroleum Institute. http://www.archive.org/details/prelinger [15 minutes]
- Patel, Raj. (2009, November 2). Ending Africa's Hunger. Retrieved from: http://rajpatel.org/2009/11/02/ending-africas-hunger-2/
- Pollan, Michael (2007, January 28). Unhappy Meals. In *The New York Times.* Retrieved from: http://www.nytimes.com/2007/01/28/magazine/28nutritionism.t.html?pagewanted=1
- Richter, Robert (Producer). (1985). *Hungry for Profit*. United States: New Day Films. 1985 [90 min]

Lesson 6: Consequences of Global Demand for Oil

Overview

Students learn about oil, an energy source absolutely critical to technology-intensive globalization. They examine why global demand for oil has spiked in recent decades and assess the geopolitical and environmental consequences of that demand.

Relevant Learning Objectives

2. Evaluate the geopolitical, social and environmental consequences of technology on society

Procedure

Possible Classroom Activities:

- Discussion on Oil and Geopolitics.
  (Time: 25 minutes)(Skills: Holistic Thinking) (Objective 2)(Related Resources: Yergin, Klare and Friedman readings and Powerpoint Consequences of Global Demand for Oil)

  Compare and contrast readings and perspectives on oil and geopolitics. Answers and notes provided in power point. This activity can be done in a frontal style or in small group discussions. Students could read one of the readings and then contribute to the group discussion based on that reading.

    o In Daniel Yergin's account, why did global consumption of oil skyrocket in the decades after World War II, and what were periodic threats to its worldwide distribution?
    o According to Michael Klare, how has oil been a historic factor in geopolitics and how does current competition among the U.S., Russia, and China for influence over global distribution of petroleum aggravate tensions in the oil rich regions of the Persian Gulf and Caspian Sea basin?
    o What does Thomas Friedman identify as the four adverse political effects around the world of American and international addiction to oil? How has that addiction intensified the threats of terrorism and weakened democratic and economic development in oil-rich countries?

- Discussion on Energy Challenges.
  (Time: 20 minutes) (Skills: Holistic Thinking) (Objective 2)(Related Resources: Ghazvinian and Tucker readings and Powerpoint Consequences of Global Demand for Oil)

Compare and contrast readings and perspectives on energy challenges in the developing world. This activity can be done in a frontal style or in small group discussions. Students could read one of the readings and then contribute to the group discussion based on that reading.

- o What does John Ghazvinian suggest are the economic and strategic underpinnings of the contemporary boom oil development? In what ways have some African societies suffered the "curse of oil?"
- o According to Richard Tucker, how did the demand for natural rubber tires among the world's swelling ranks of car drivers affect tropical forest ecosystems in South America, Asia, and Africa in the first half of the 20th century?

- Research Activity.
  (Time: 15 minutes)(Skills: Holistic Thinking, Cross-cultural Communications and Technology Skills) (Objective 2)(Related Resources: Ghazvinian or Tucker reading)

  Students (individually or in small groups) conduct online research for class presentation and/or short paper on different global case studies of the politics, geopolitics, or environmental implications of oil production and distribution (e.g. domestic politics of oil production or conservation in Alaska; Venezuelan oil and Latin American geopolitics; oil and the strategic impulse behind war in Iraq; oil and the wars in Sudan; oil and issues of global warming; etc.).

- Video Activity.
  (Time: 60 minutes)(Skills: Holistic Thinking) (Objective 2)(Related Resources: *The Prize: the Epic Quest for Oil, Money, and Power* movie)

  Watch the following one hour documentary and discuss what it suggests are the geopolitical and environmental consequences of global demand for oil.

- Historical Video Activity.
  (Time: 14 – 25 minutes)(Skills: Holistic Thinking) (Objective 2)(Related Resources: "Oil Today- Power Tomorrow," "Oil for Aladdin's Lamp," "Assignment- Venezuela," or"Desert Venture"films)

  Watch one of the following online historical videos and discuss how it promoted the benefits of U.S. international trade and consider what global costs of that trade, from the perspective of other people, it failed to address.

- Carbon Footprint Activity.
  (Time: 10 minutes)(Skills: Holistic Thinking) (Objective 2)(Related Resources: http://www.nature.org/greenliving/carboncalculator/)

Have students complete the carbon calculator and discuss the results in class. What historic, political, social, and economic factors contributed to the final outcome?

Ask students to reflect how the various authors would explain how their case studies could be applied to the carbon footprint.

Resources

- *Assignment- Venezuela*. (1956) United States: Sound Masters Inc. http://www.archive.org/details/prelinger [24 min]
- *Desert Venture*. (1948) United States: Richie Video. http://www.archive.org/details/prelinger [Part I 13:53; Part II 14 min]
- Friedman, Thomas. (2008). Fill 'Er Up with Dictators: Petropolitics. In *Hot, Flat, and Crowded: Why We Need a Green Revolution- And How It Can Renew America* (77-110). New York: Farrar, Straus and Giroux.
- Ghazvinian, John. (2007, April 2). Untapped: The Scramble for Africa's Oil. In *Slate*. Retrieved from: http://www.slate.com/id/2163389/
- Klare, Michael T. (2004, September 30). Blood and Oil: The Dangers and Consequences of America's Growing Dependency on Imported Petroleum. Retrieved from: http://www.carnegiecouncil.org/resources/transcripts/5017.html
- *Oil for Aladdin's Lamp*. (1949). United States: Shell Oil Company. http://www.archive.org/details/prelinger [20 minutes]
- *Oil Today- Power Tomorrow*. (1950). United States: Frith Films. http://www.archive.org/details/prelinger [16 min]
- Powerpoint Consequences of Global Demand for Oil
- The Prize: the Epic Quest for Oil, Money, and Power. Episode 8 in *The Tinderbox: The New Order of Oil*. (1993). United States: Public Media Videos. Retrieved from: http://www.youtube.com/watch?v=vgt1ZLDIy1M&feature=related
- Tucker, Richard. (2007). The Tropical Cost of the Automotive Age: Corporate Rubber Empires and the Rainforest. In *Insatiable Appetite: The United States and the Ecological Degradation of the Tropical World* (113-150). New York: Rowman & Littlefield Pub., Inc,.
- Yergin, Daniel. (1992). Hydrocarbon Man. In *The Prize: The Epic Quest for Oil, Money, & Power* (541-560). New York: Simon and Schuster.

Optional Resources

- Berman, Bradley. (2011, February 18). New Wrinkle in Hybrid Cars. In *The New York Times*. Retrieved from: http://www.nytimes.com/2011/02/20/automobiles/20TECH.html?ref=electricvehicles

- *Key World Energy Statistics* (2009.). Retrieved from: http://www.iea.org/textbase/nppdf/free/2009/key_stats_2009.pdf [*this has good data/tables throughout, the Supply, Consumption, Emissions and Outlook sections are particularly relevant]*
- Motavelli, Jim. (2011, February 28). EV's Are Here, but Can Utilities Handle the Load. In *The New York Times*. Retrieved from: http://wheels.blogs.nytimes.com/2011/02/28/e-v-s-are-here-but-can-utilities-handle-the-load/?ref=electricvehicles
- Paine, Chris (Producer). *Who Killed the Electric Car*. Retrieved from http://www.whokilledtheelectriccar.com/

Lesson 7: Environmental Costs of Technological Development

Overview

Students identify many of the technologies that have transformed the natural world as they have facilitated modern globalization. They also learn about the environmental and public health costs of technology-intensive globalization.

Relevant Learning Objectives

2. Evaluate the geopolitical, social and environmental consequences of technology on society

Procedure

Possible Classroom Activities:

- Lecture and Discussion on Technology and the Environment.
  (Time: 40 minutes) (Skills: Holistic Thinking) (Objective 2)(Related Resources: McNeil, Leslie, Easterbrook, and Wood readings)

  Compare and contrast readings and perspectives on technology's impact on the environment. This activity can be done in a frontal style or in small group discussions. Students could read one of the readings and then contribute to the group discussion based on that reading. Please note the powerpoint does not include the McNeill reading.
  - o What clusters of technology, energy sources, and economic practices does J.R. McNeill suggest had significant effects on societies and the natural environment over the course of the 20th century?
  - o According to Jacques Leslie, why is much of the world's supply of freshwater in danger, and how is that mounting crisis affecting individual nations and their relations with one another?
  - o What does Gregg Easterbrook speculate might be the effects of global warming on people, the global economy, and the distribution of power among nations around the world?
  - o According to Graeme Wood, what technologies and techniques of "geo-engineering" may temporarily alleviate global warming associated with the buildup of greenhouse gases in earth's atmosphere? What potential dangers do these technologies and techniques pose?

- Deepwater Horizon Activity.
  (Time: 15 minutes)(Skills: Holistic Thinking) (Objectives 2)(Related Resources: n/a)

Compare and contrast the impact of the Deepwater Horizon oil rig disaster (or any other recent environmental disaster) on the lives of the student vs. someone in the area vs. global impact.

"How does the Deepwater Horizon oil rig disaster impact your daily life?", "How does the Deepwater Horizon oil rig disaster impact you're the daily lives of people living in the area?", and "How does the Deepwater Horizon oil rig disaster impact the life of a global citizen?"

- Environment Video Activity.
  (Time: 55-112 minutes)(Skills: Holistic Thinking) (Objectives 2)(Related Resources: "The Last Oasis," "RX for Survival: Bird Flu: How Safe Are We?" or "Global Warming: What's Up With the Weather")

  Watch one of the following documentaries and discuss what it suggests are major environmental problems and their technological causes and/or solutions.

- Alternative Student Reading Activity.
  (Time: 15 minutes)(Skills: Holistic Thinking) (Objectives 2)(Related Resources: Pauly or Diamond reading)

  Students read one of the following readings and present the author's accounts to the class.

- Technology and Land Development Role Play.
  (Time: 40-60 minutes)(Skills: Holistic Thinking) (Objectives 2) (Related Resources: Appendix D and Culture-HR-Assignment_on_Diversity_in_Leisure.ppt)

  Students prepare materials in class and make presentation. Divide the class into eight groups of 6 students each. Each group presents for five minutes.

  Students are put into small groups and told that each group represented a planning firm that was hired to develop a piece of land. The students are shown the current configuration of the land, which included a stream, pond, wetland, and forested areas. They are given a piece of poster board of the same size and are also given pieces of various colored construction paper to represent the amount of land that was a stream, pond, wetland, and forest. Students are also given the approximate footprint size of a variety of building types. Their goal is to create a map-like representation of their designed community.

  The students are then set loose to complete the project with one person assigned as a recorder to write down and document all of the decisions the group made. The students use scissors and colored pencils to alter their materials to visually represent their

community design. As they are working, the students keep track of what technology was involved in constructing this community as well as the technology involved in changing the existing environment into their new design. The students also discuss the technology it would take to make their community work on a day to day basis (heating and cooling of buildings, water sources, disposal of trash, etc.) The students then present their ideas to the group with their poster board serving as a visual aid during the discussion.

Resources

- Appendix D
- Culture-HR-Assignment_on_Diversity_in_Leisure.ppt
- Diamond, Jared. (2005). China, Lurching Giant. In *Collapse: How Societies Choose to Fail or Succeed* (358-377). New York: Viking.
- Easterbrook, Gregg. (2007 April). Global Warming: Who Loses- and Who Wins?. In *The Atlantic*. Retrieved from: http://www.theatlantic.com/doc/200704/global-warming
- *Global Warming: What's Up With the Weather*. (2007). United States: NOVA. [112 minutes]
- Leslie, Jacques. (2000 July). Running Dry: What happens when the world no longer has enough freshwater?. In *Harper's Magazine*, 37-52.
- McNeill, J.R. (2000). Fuel, Tools, and Economics. In *Something New Under the Sun: An Environmental History of the Twentieth-Century World.* (296-324). New York: W.W. Norton.
- Pauly, Daniel. (2009, September 28). Aquacalypse Now: The End of Fish. In *The New Republic*.
- *RX for Survival: Bird Flu: How Safe Are We?.* (2005). United States: PBS. [56 minutes]
- *The Last Oasis. Cadillac Desert*. (1997). United States: PBS. [55 minutes, *on building of large-scale dams around the world*]
- Wood, Graeme. (2009 July/August). Reengineering the Earth. In *The Atlantic Monthly* Retrieved from: http://www.theatlantic.com/doc/200907/climate-engineering

Optional Resources

- Leake, Jonathan and Woods, Richard. (2009, January 11). Revealed: The Environmental Impact of Google Searches. In *The Times*. Retrieved from: http://technology.timesonline.co.uk/tol/news/tech_and_web/article5489134.ece [*This article directly relates to students' usage of technology and is therefore a good personal-interest point*]
- Rare Earth Elements Fueling Innovation.(2010, October 15). *Globalization101*. Retrieved from: http://www.globalization101.org/news1/Rare-Earth-Elements
- Types of Impacts. (Retrieved on May 10, 2011). Retrieved from: http://www.unep.or.jp/ietc/publications/integrative/enta/aeet/6.asp

- Technology Solutions for Mitigating Environmental Impacts of Oil and Gas E&P Activity. (Retrieved on May 10, 2011). Retrieved from: http://www.netl.doe.gov/publications/factsheets/program/Prog101.pdf [R&D objectives are helpful]

Appendices

Appendix A

Background to Assignment:
Students were asked to identify a person in a professional capacity at their campus from a foreign culture. Next they were asked to conduct research on this target culture to familiarize themselves with the specific nuances of this culture. Using their newly acquired knowledge, the students then interviewed their selected person about their mobile technology usage. The interview questions used are attached to this email. The students were then asked to write a comprehensive report based on their researched cultural findings and expectations of the target culture as well as their findings from the interview. The students did a brief presentation of these findings to the class.

Instructions: The purpose of this interview is to gain an understanding of cross cultural communication behavior in the 21st century. Please carry out your cross cultural interview using the following questions. Be sure to incorporate what you have learned from your research papers and the detailed interview protocol instructions from class.

1. Do you call overseas relatives regularly (weekly)? If so, how often do you call? During the week, when do you typically make the majority of these phone calls?

2. What technology do you typically use to call overseas? (home phone, mobile device, voice over IP [Skype], other)

3. Approximately, how long would a typical phone call with a relative last? Would this time vary for special occasions? If so, could you please share an example of a recent special occasion where you spent longer than usual communicating with overseas relatives.

4. During a typical phone call with an overseas relative, what would be some of the general topics of the conversation? For example, health, family, birthdays, significant achievements etc.

5. Can you recall and share with me the order of topics of your most recent overseas conversation with relatives? Does this order vary significantly with certain relatives? For example, does this order vary with the age of the relative?

Walmart's Revolutionary Power (12 minutes, 30 seconds)
- What standards are Walmart setting for international business?
- How does Walmart keep its prices low?
- What is push production and pull production? What are the impacts of Walmart's pull production?
- What technologies have facilitated this shift?

Muscling Manufacturing (7 minutes 15 seconds)
- Explain the consequences of the shifting of power from manufacturers to retailers? How does Walmart exemplify this trend?
- Rubbermaid represents the high road to competitiveness and Walmart the low road? Do you agree? Why or Why not?

The Strategy Low Costs and Go Global (9 minutes 29 seconds)
- What is Walmart's strategy of "the opening price point" and how does it impact what they buy/sell and where their suppliers manufacture their goods?
- Why did Walmart and other companies choose China as its manufacturing hub?

China's View of Walmart—Big Partner (11 minutes 44 seconds)
- Compare and contrast the perspective of Walmart by Chinese manufacturers, U.S. manufacturers, and US retailers?
- How can the U.S. workers compete with .50 cents/hour wage of Chinese employees?
- Explain how Walmart and China are a joint venture?
- Why does the U.S. have a trade deficit with China?

Taking the Hits (15 minutes 25 seconds)
- What is the impact of China's export boom on the U.S.?
- What is dumping and how does it impact global manufacturing?
- Should the U.S. give up manufacturing altogether? Why or why not?
- Is Walmart good for America? Explain

Appendix C: Case Study: Brazil and Agribusiness

Background

Brazil is the largest country in the world in terms of arable land. Only a fraction though is exploited for agricultural use. Brazil is one of the world's biggest suppliers of agrifood commodities. Since 2007, it is the world's largest exporter of red meat, poultry, sugar, coffee, and orange juice, the second largest exporter of soybeans, soy meal, and soy oil, third largest exporter of corn, and fourth largest exporter of pigs and cotton. Brazil's domestic market, the third largest in size in the developing world behind China and India, is also an investment target.[10] China is the biggest market of Brazilian agricultural exports.

The agrifood business has been concentrated in the hands of a few major multinational corporations, whose reach penetrated the developing world in the 1980s and 1990s. In the 1980s, biotechnology revolutionized the agribusiness industry. These firms lobbied for patents for their products. Subsequently the World Trade Organization required countries in accession to accept the patents.[11] Raj Patel, author of *Stuffed and Starved*, notes that there are 10 companies worldwide that control half of the world's seed supply; there are also 10 firms that control the 84 percent of the $30 billion dollar pesticide market.[12]

In Brazil, traditionally, national companies and cooperatives farmed products for domestic staple production, while multinationals mainly farmed for middle class consumption and for international trade. Three main domestic firms (Ceval, Sadia, and Perdigão) produced soybeans for animal feed. However deregulation in 1990s, brought in the foreign multinationals (Bunge, Cargill, ADM, and Dreyfus) who replaced the domestic producers. These multinationals control the pesticides market in Brazil and worldwide, a crucial component of the oil seed production. Their dominance in Brazil coincided with the biotech revolution. Companies introduced genetically modified (GMO) seeds, furthering their competitive advantage.[13]

There has been considerable resistance by Brazilian NGOs to the proprietary control of strategic genes. They waged a battle against the introduction of genetically modified seeds. Nonetheless these seeds dominate soy production and are advancing in corn and cotton production.

Brazil's domestic agribusinesses have grown dramatically in the past 5-10 years. There are 20 Brazilian agribusiness companies that have annual sales more than $1 billion dollars.[14]

Situation

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[10] Wilkinson, John. "The Globalization of Agribusiness and Developing World Food Systems." September 2009
[11] Ibid.
[12] Trigona, Marie. "The Soy Republic of Argentina." September 3, 2009.
[13] Wilkinson, John. "The Globalization of Agribusiness and Developing World Food Systems." September 2009.
[14] The global power of Brazilian agribusiness. http://www.businessresearch.eiu.com/global-power-brazilian-agribusiness.html

Brazil's Forest Conservation Law, which was passed in 1965, limits the use of woodlands for agricultural purposes. Depending on the location, the law requires that owners to keep as much as 80 percent of the land in its natural state.[15]

In May 2011, the Senate in Brazil was presented with a law to revise the protection of the Amazon. Proposed changes included:

- Exempting small landowners from requirement to preserve 80% forest
- Giving amnesty to landowners who cleared forest before 2008
- Reducing the strip of land that must be left intact along the banks of rivers and streams from 30m (100ft) to 15m (50ft).[16]

The Brazilian Senate is holding a hearing where it will hear arguments from different players before they decide to pass this law as is or if they will make changes to the law.

Players:

Foreign Multinational Agribusinesses
Brazilian Agribusinesses
Brazilian farmers and ranchers
Migrant farm and ranch workers
Brazilian consumers
Environmental NGOs

Activity
A team of students will represent each of the players in this conflict.
1. Each team writes a 1-2 page character study of their player and a 3-5 page paper explaining their perspective on the issue at hand.
2. The team presents their perspective to the class, who will serve as the Senate in Brazil. Use of technology and multi-media should be encouraged.
3. Once all the perspectives are presented the class will vote to either: pass, amend, or not pass the law.
4. Once the decision is made, students will write a 2-4 page paper reflecting on their personal feelings on the issue.

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[15] "Brazil does away with laws to protect large swathes of rainforest." The telegraph (June 30, 2011). Retrieved from: http://www.telegraph.co.uk/news/worldnews/southamerica/brazil/8537162/Brazil-does-away-with-laws-to-protect-large-swathes-of-rainforest.html
[16] "Brazilian Farmers Push Law to Weaken Environmental Protection of the Rain Forest," On My Watch blog (May 27, 2011). Retrieved from: http://samandimp.wordpress.com/2011/05/27/brazilian-farmers-push-law-to-weaken-environmental-protection-of-the-rain-forest/

Appendix D Technology Land Development Role Play

Technology Land Development Role-Play Instructions

As you are working, your group needs to decide what your community will look like and design it using the materials provided. One group member should be the recorder who makes notes on the decisions the group makes. The recorder should also note what changes are made to the existing environment. Are trees taken down or replanted? Is the stream diverted or dammed? Also not the technology involved with every aspect of your project. If you want to redirect the stream, roughly how will that be done and what technology will be involved?

If your goal is to create a moderately self-sustaining community, what does that really mean and how can you put it into practice? Think about:

- Food
- Waste
- Transportation
- Child care
- Elder care
- Pets
- Energy
- Shopping
- Restaurants
- Water use
- Education
- Recreation
- Entertainment

Please be creative with this assignment. You will need to add other buildings or structures to your community. You are not limited to what is on the front of this page.

Home Types and Prices

McMansions: Very large homes on large lots
        Target Audience: Wealthy families who feel status and exclusivity are very important.
        Selling Price: $750,000
        Profit: $250,000

Large Lot: Large homes on large lots
        Target Audience: Those who cannot quite afford a McMansion, but appreciate the status.
        Selling Price: $325,000
        Profit: $120,000

Medium Lot: Average size home on medium size lot

Target audience: Families, single individuals
Selling Price: $150,000
Profit: $55,000

Small Lot: Small homes on a small lot
Target audience: Retirees, starter homes, single individuals
Selling Price: $100,000
Profit: $35,000

Duplex: One building with two small homes sharing a wall
Target audience: Retirees, starter homes, single individuals, young families
Selling Price: $70,000 per side
Profit: $20,000

Apartment Buildings: One structure with multiple floors
Target audience: Single individuals, retirees, young families
Selling price (for the building): $200,000
Profit: $80,000 annually

These are some of the buildings available for your project. You may identify a new kind of building for your use. If you do identify a new building, be sure to estimate a selling price and profit for it.

Group 1
Your planning firm has been hired by Monty Moneybags who has recently purchased some of Farmer Brown's land, adjacent to an area that is still actively being farmed. Monty wants to **make as much money as possible** from this transaction and doesn't particularly care how this is done. However, the community should be moderately self-sustaining and should be attractive to people of various backgrounds. It is your job to design an area that best meets Monty's needs.

Group 2
Your planning firm has been hired by Patricia Peacelover who has recently purchased some of Farmer Brown's land, adjacent to an area that is still actively being farmed. The purchaser wants to create a unique housing development that **shows that people of all backgrounds, incomes, and lifestyles can live in a community together**. Patricia is willing to make less money on this investment to put his experiment in motion. The community should be moderately self-sustaining and should be attractive to people of various backgrounds. It is your job to design an area that best meets his needs.

Group 3
Your planning firm has been hired by Friends of the Forest which purchased some of Farmer Brown's land, adjacent to an area that is still actively being farmed. Friends of the Forest want

to design an **Ecovillage-type** housing development that promotes community involvement, teamwork and is friendly towards the environment. The community should be moderately self-sustaining and should be attractive to people of various backgrounds. It is your job to design an area that best meets their needs.

Group 4
Your planning firm has been hired by Gail Golpher who purchased some of Farmer Brown's land, adjacent to an area that is still actively being farmed. Gail Golpher wants to design a community **around a 9 hole golf course**. She wants the community to be attractive to people with a moderate income who are concerned about image and status, but cannot afford the best. She is also concerned about making a profit on this and having a golf course that is attractive and could bring in income through memberships for those outside of the community. The community should be moderately self-sustaining and should be attractive to people of various backgrounds. It is your job to design an area that best meets her needs.

Group 5
Your planning firm has been hired by Larry Lotsofchildren who purchased some of Farmer Brown's land, adjacent to an area that is still being actively farmed. Larry Lotsofchildren would like to create a community that is **attractive to young families**. He would like the community to be fairly unique and to be more competitive that typical developments that only have single family homes and no other types of housing or amenities. The community should be moderately self-sustaining and should be attractive to people of various backgrounds. It is your job to design an area that best meets their needs.

Group 6

Your planning firm has been hired by Carl College who purchased some of Farmer Brown's land, adjacent to an area that is still being actively farmed. Carl College would like to create a community that is **attractive to college students**. He would like the community to be fairly unique and to be more competitive than typical student housing. The community should be moderately self-sustaining and should be attractive to students of various backgrounds. It is your job to design an area that best meets his needs.

Group 7
Your planning firm has been hired by Samantha Singleton who purchased some of Farmer Brown's land, adjacent to an area that is still being actively farmed. Samantha Singleton would like to create a community that is **attractive to singles and the recently divorced**. She wants to start a revolution in the housing industry and has picked your firm because of its creativity. She has suggested having a variety of housing that would appeal to the hip crowd. The community should be moderately self-sustaining and should be attractive to people of various backgrounds. It is your job to design an area that best meets her needs.

Group 8

Your planning firm has been hired by Orna Originality who purchased some of Farmer Brown's land, adjacent to an area that is still being actively farmed. Orna Originality would like to create a community that is **based on convenience in all aspects of life for people living there**. She wants to start a revolution in the housing industry and has picked your firm because of its creativity. She has suggested having a variety of housing that would appeal to the busy individuals. The community should be moderately self-sustaining and should be attractive to people of various backgrounds. It is your job to design an area that best meets her needs.

Assessments

Lesson 1

Students map the historical development and uses of a particular technology on society. Potential technologies: telephone, steam engine, fax machine, printing press, car, radio, camera, phonograph, etc. A list of potential technologies: (http://www.history-timelines.org.uk/events-timelines/12-technology-timeline.htm).

This map should be done from either the internalist or contextualist perspective. Students should note which perspective they are taking when developing the map. Research and maps will need to be done before class. This can be done as an assignment and/or the students can present their findings to the class. Class time can be taken to make sure the students understand the two perspectives and understand how to use the mindmapping website (http://www.mindmeister.com/).

Lesson 2

Students write an essay that identifies the books central argument(s) and suggest other celebrities or products turned into global brands via mass media technologies. Student should apply knowledge gained in the classroom discussion on communications technologies. (Related Resources: LaFeber reading)

LaFeber, Walter "The Globalization of Michael Jordan," *Michael Jordan and the New Capitalism* (W.W. Norton, 1999), 49-74.

Lesson 4

Students look through *Mapping the Global Future: Report of the National Intelligence Council 2020 Project* (National Intelligence Council, 2004) – available online through Worldcat database- and identify (in a short essay) how one of the several military-related technologies it addresses will influence U.S. and global security issues in the coming years.

Students read an English-language newspaper from a different country and, based on articles about its military power and policy, write a 3-4 page essay explaining what that newspaper regards as the purpose and value of the nation's military complex.

Lesson 6

3-4 page "Thought Paper/Essay" answering the following question: How has the price of oil (whether relatively low or high) affected your life, and how are those effects different from those experienced by people living in poorer, oil-producing countries?

Lesson 7

3-4 page "Thought Paper/Essay" in which they answer one of the following questions: "What effects does your lifestyle and/or the goods and services you consume have on the natural environment both near and far (anywhere around the world)? or "What are the similarities and/or differences between the environmental effects of high-tech globalization you experience and those experienced by people living in another part of the world?