The Sciences and the Humanities: Two Cultures?

A Module for an International and Interdisciplinary Core Curriculum

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Authors

GEETHA BAKILAPADAVU is Professor of English and Cultural Studies at K K Birla Goa Campus, BITS Pilani. She is the Indian PI of the SPARC project 'Public Humanities and Pedagogy in the Global South'.
Contact: geethab@goa.bits-pilani.ac.in

REENA CHERUVALATH is a Professor at the Department of Humanities and Social Sciences, Birla Institute of Technology and Science, Pilani K.K. Birla Goa Campus, India. She has a PhD in Philosophy. She works in the areas of ethical decision-making and creativity.
Contact: reena@goa.bits-pilani.ac.in

DAVID KALDEWEY is Professor for Science Studies and Science Policy at the University of Bonn, Germany. He currently serves as co-spokesperson of the Rhine-Ruhr Center for Science Communication Research (RRC).
Contact: kaldewey@uni-bonn.de

HAREESH A.G is an Assistant Professor of Philosophy at the Department of Humanities and Social Sciences at BITS Pilani K. K. Birla Goa Campus, India. He works in the areas of philosophy of biology and philosophy of technology and holds a PhD in philosophy.
Contact: hareeshkbi@gmail.com

DÉSIRÉE SCHAUZ is Professor at the Department of History at the Karlsruhe Institute of Technology. Her research and teaching interests include the history of science, technology and the humanities.
Contact: desiree.schauz@kit.edu

ANDREAS SIESS worked as a designer and engineer and holds a PhD in Cultural Studies. He currently investigates and develops forms & formats of science communication at Bonn-Rhine-Sieg University of Applied Sciences as part of the RRC.
Contact: andreas.siess@h-brs.de

LAKSHMI SUBRAMANIAN is a retired professor of history. She has had a long and distinguished teaching and research career that spans four decades with speciaspecialisation are the history of capital and business in India, networks of trade and piracy in the Indian Ocean in the colonial era and the histories of music and performance in modern South India. She has an active interest in developing a broader audience for the humanities and social sciences.

SARAH TOBER has a background in Literary and Cultural Studies. She works at the Institute for Advanced Study in the Humanities (KWI) Essen and is part of the RRC.
Contact: sarah.tober@kwi-nrw.de

Introduction

This curriculum is one of the outcomes of the research project „Public Humanities and Pedagogy in the Global South“, funded by the Government of India (SPARC project no. 1871). The project brought together an international and interdisciplinary team, with meetings in Germany (2024) and India (2025). As part of our collaboration, we designed a new course tailored for STEM students at BITS-Pilani, Goa Campus. Each contributor brought unique disciplinary perspectives to the course and taught sessions to a diverse group of students during the spring semester of 2025. We all benefited greatly from the stimulating discussions with both students and colleagues.

The course evolved into an intercultural learning space and provided a platform not only to examine the classic „two cultures“ divide—between the natural and engineering sciences on the one hand and humanities and social sciences on the other—but also to engage with the cultural and national diversity of our team. More broadly, we reflected on Indian-German research collaboration, the role that the humanities in technically-oriented institutions of higher learning (such as German Technical Universities), and the dynamics and challenges of international academic collaboration.

We are convinced that the long-standing debate on the „two cultures“ remains a productive starting point for students, educators and researchers interested in critically examining their roles and positions within their institutions, academic communities, and the global system of science and higher education. The topics and ideas presented here build on the course developed for BITS-Pilani and is intended not as a fixed program, but as a flexible toolkit. It is designed for educators seeking to create and adapt similar courses—particularly in alternative institutional and international contexts.

The idea of publishing such “core curricula” as open educational resources emerged in connection with another project: the Rhine Ruhr Center for Science Communication Research (RRC), funded by the Volkswagen Foundation (2021-2026). A central insight of our work is that teaching—especially in interdisciplinary settings—should be recognized as a vital form of science communication. Here, students are not seen as passive recipients of knowledge, but as active intermediaries who bridge the different lifeworlds of the university, their communities, personal networks, and their future professions.

Finally, we invite everyone who uses or adapts elements of this curriculum to share their experiences with us. Please feel free to reach out to the authors.

1. Two Cultures?

An Introduction

Content

- The two Cultures as C. P. Snow perceived them—the importance of science; lack of similar respect for the Humanities; disconnect from those in the Humanities; mutual unfamiliarity with the other
- Criticism of Snow's two culture metaphor by F. R. Levis
- More recent debates on the subject
- Emerging case for interdisciplinarity

Learning objectives

By the end of this module, students will be able to understand C. P. Snow's concept of two cultures and the divide between scientific and literary intellectuals as enunciated by him, examine the veracity of Snow's claims about the two cultures. They will also comprehend the essence of F. R. Leavis' critique of Snow's position. The module will enable the students to explore certain recent debates on the subject

Material

- Snow, C. P. (1959). The Two Cultures and the Scientific Revolution. Cambridge University Press. https://doi.org/10.1017/CBO9781139196949
- Leavis, F. R., & Collini S. (1962/2013). Two Cultures?: The Significance of C. P. Snow. Cambridge University Press. https://doi.org/10.1017/CBO9781107337169

Suggested assignments

a) Divide the class into two groups—'for the Sciences' and 'for the Humanities'—and ask them to debate over any/all of the following questions:
   - How are the sciences and humanities different?
   - Are they complementary to each other in any way?
   - What are their arguments on the importance of their field in terms of its contribution to knowledge creation, problem-solving, human creativity, and overall well-being?
   - Conclude by asking the students to think over possible points of intersections between the two.

b) Give an excerpt from the text of C. P. Snow's essay and ask the students to identify objectivity or the lack of it in terms of his observations and arguments. This would help them read the text critically.

Further reading

- Barnes, J. (2022). The 'two cultures' in Australia. History of Education, 52(6), 849-867. https://doi.org/10.1080/0046760X.2022.2097742
- James, F. A. J. L. (2016). Introduction: Some Significances of the Two Cultures Debate. Interdisciplinary Science Reviews, 41(2–3), 107–117. https://doi.org/10.1080/03080188.2016.1223651

2. Two Cultures in India?

Impact of the Colonial Legacy

Content

- The colonial legacy—The London model of the University and emphasis on the classics, liberal arts, political philosophy and law.
- An instrumentalist approach to science
- Nationalist articulations and the emergence of a scientific consciousness
- Early Indian scientists, institutions and their agenda—faultlines of caste in science

Material

- *Journal of a residence of two and a half years in Great Britain by Jehangir Naurojee and Hirjeebhoy Merwanjee of Bombay*, Chapter XI, 1841. Available at archive.org: https://archive.org/embed/dli.ministry.15585
- Sangwan, S. (1988). Indian Response to European Science and Technology, 1757-1857. *British Journal for the History of Science 21*(2), 211-232. https://doi.org/10.1017/S0007087400024778

Further reading

- Chakraborty, P. (2000). Science, Nationalism, and Colonial Contestations P.C. Ray and His Hindu Chemistry. *Indian Economic and Social History Review, 37*(2), 185-213. https://doi.org/10.1177/001946460003700203
- Kumar, D. (2000). Science and Society in Colonial India Exploring an Agenda. *Social Scientist, 28*(5/6), 24-26. https://doi.org/10.2307/3518179
- Kumar, D. (1969). The 'Culture' of Science and Colonial Culture, India 1820-1920. *British Journal for the History of Science, 29*(2), 195-209. https://doi.org/10.1017/S0007087400034221

Learning objectives

Students are expected to familiarize themselves with the complexities of the colonial legacy in terms of knowledge production, the rationale for the adoption of a very particular scientific policy by colonial masters and the dynamics of their reception by indigenous intelligentsia. They will also encounter the role science played in the national imaginary from the late 19th century and the faultiness in scientific discourse.

Suggested assignments

a) What were the imperatives of colonial science policy? How were these received and interrogated by the subject population?

b) How did nationalist imagination reconcile the adoption of modern science with the reinvention of tradition?

3. What Role Does Science Play in Democracy?

Lessons from Post-colonial India

Content

- What was the Nehruvian vision? How did Nehru address the predicament of postcolonial science especially in relation to the authority of science and its capacity to deliver social and economic change?
- What were the consequences of Nehru's policy? Sociological consequences and institution building? How did institutionalization reveal social fault-lines?
- Developments in the 1970's and 80's: Reverses and rising tide in anti-modernism and anti-science and the response.

Material

- Anderson, R. (1975). *Building Scientific Institutions in India: Saha and Bhabha*. McGill University Centre for Developing-Area Studies.
- *Rocket Boys* Web series.

Further reading

- Arnold, D. (2013). Nehruvian Science and Post Colonial India. *Isis, 104*(2), 360-370. https://doi.org/10.1086/670954
- Sur, A. (2002). Scientism and Social Justice: Meghnad Saha's Critique of the State of Science in India. *Historical Studies in the Physical and Biological Sciences, 33*(1): 87–105. https://doi.org/10.1525/hsps.2002.33.1.87
- Viswanathan, S. (1998). A Celebration of Difference: Science and Democracy in India. *Science 280*(5360), 42-43. https://doi.org/10.1126/science.280.5360.42
- Viswanathan, S. (2001). Democracy, Governance and Science: Strange Case of the Missing Discipline. *Economic and Political Weekly, 36*(39), 3684-3688. http://www.jstor.org/stable/4411164

Learning objectives

Students are expected to navigate the agenda of independent India's science policy and the ways in which India engaged with science as part of democracy. They will also engage with the practicalities of institution building and how the slow bureaucratization of science robbed science of its creative element and removed it away from the democratic domain. At the end of the session, students would also become familiar with the developments of the tumultuous 70's that ironically brought science back to the forefront of public imagination, not by mainstream scientists but by environmentalists and scientist-activists.

Suggested assignments

a) Elaborate the concept and character of Nehruvian science. How did it resolve the problem of postcolonial science?

b) Would you argue that the engagement between science and democracy in post independent India has been a troubled one?

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4. How International is Academia?

Science and (Inter)national Politics

Content

- Historical overview of international relations in science from the early modern cosmopolitical "republic of letters", late 19th century internationalisation of science, frictions and professional solidarity in the cause of the World Wars, the divided scientific internationalism during the cold-war era, to recent science-diplomacy initiatives
- Discussing processes and effects:
  - Interlocking of internationalisation of science and nationalisation of scientific cultures
  - Competition over national prestige, techno-scientific innovations, and scientific personnel
  - Asymmetric relations between hegemonic/leading science nations and catching-up states
  - Concurrence of the epistemic claim of universalism and the political settings of science

Material

- Campbell, W. W. (1920). Report of the Meetings of the International Research Council and of the Affiliated Unions Held at Brussels, July 18-28, 1919. In *Proceedings of the National Academy of Sciences of the United States of America, 6*(6), 340-348. https://doi.org/10.1073/pnas.6.6.340
- The Russel-Einstein-Manifesto (1955) as an example for scientific pacifism and cosmopolitism
- Lists of nobel prize winners circulating in the internet with various groupings as examples for national competitiveness
- Science diplomacy agenda from different countries or organisations

Further reading

- Somsen, G. J. (2008). A History of Universalism. Conceptions of the Internationality of Science from the Enlightenment to the Cold War. *Minerva*, 46(3), 361-379. https://doi.org/10.1007/s11024-008-9105-z
- Kraft, A., Nehring, H., & Sachse, C. (2018). The Pugwash Conferences and the Global Cold War. Scientists, Transnational Networks, and the Complexity of Nuclear Histories. Introduction. *Journal of Cold War Studies*, 20(1), 4–30. https://doi.org/10.1162/jcws_e_00799
- Flink, T. (2020). The Sensationalist Discourse of Science Diplomacy: A Critical Reflection. *The Hague Journal of Diplomacy*, 15(3), 359-370. https://doi.org/10.1163/1871191X-BJA10032

Learning objectives

Students are enabled to reflect on the restrictions of the ethos of scientific universalism against the backdrop of international politics, critically examining how diplomatic, economic and ideological pressures delineate the limits of universal claims. They will be empowered to distinguish between different motives, goals and practices of scientific internationalism—from transnational research networks and humanistic ideals of science to strategic alliances driven by national agendas. Finally, students gain awareness of the political dimensions in international scientific relations, encompassing both the national professional politics of scientists and the foreign-policy strategies of states.

Suggested assignments

a) Write a report on the science-diplomacy agenda of a selected country by discussing the advantages and disadvantages of the collaboration for the science nation in which you currently live. The report should reflect on the differences between the two scientific cultures as well as the existing political relations between the two countries.

b) Search for lists of Nobel Prize Winners on the internet and discuss the variation of the national rankings.

5. How Do You Explain Your Discipline?

Performativity of Science Communication

Content

- Definition of science communication (external/ internal; target audiences, stakeholders, formats etc.)
- Relevance of science communication in the academic career and in communicating with stakeholders
- Quality criteria for science communication
- Excursus: science PR, marketing and advertising
- Pop-cultural formats as science communication
- Comparative analysis of how scientists communicate disciplinary knowledge in fiction (e.g. in disaster films)

Material

- PR examples (e.g. students' own university's website, social media accounts, press releases or newsletters)
- Examples of science communication as a business case: e.g. *MIT Technology Review*
- Disaster films as case studies: *The Day After Tomorrow* (2004), *Contagion* (2011), *Don't Look Up* (2021) – differences in the portrayal of scientists in popular movies/shows

Further reading

- Medvecky, F., & Leach, J. (2019). What Are the Guiding Ethical Principles of Science Communication? In F. Medvecky & J. Leach (Eds.), *An Ethics of Science Communication* (pp. 83–92). Palgrave Macmillan. https://doi.org/10.1007/978-3-030-32116-1_9

Learning objectives

In this advanced course, students will first learn to identify the challenges involved in communicating their discipline to diverse audiences, recognizing that what resonates with one group may not be effective for another. They will analyze discipline-specific communication patterns and pinpoint the obstacles that arise when presenting information across various formats and contexts, from academic publications to public presentations. Through guided reflection, participants will cultivate an understanding of what constitutes quality in science communication, examining both content clarity and engagement strategies. Finally, they will begin to develop preliminary approaches for translating their own expertise into language and formats that are accessible to laypersons as well as to decision-makers and policy-makers, ensuring that their work can inform and influence a broad range of stakeholders.

Suggested assignments

a) How would you explain your field of study to a close relative? Write a short explanation.

b) Contact a family member or friend from a different disciplinary background. Ask them to explain what you study. Document their response (e.g. WhatsApp screenshot, memory log, voice message).

c) Collect and analyze real examples of science PR or marketing. Reflect critically on their message, strategy, and audience.

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6. Stereotypes versus Reality?

Representations of Scientists and Scholars in Pop Culture

Content

- Comparative analysis of how science, engineering, and the humanities are represented in popular culture
- Stereotypical cultural representations of scientists
- The role of stereotypes as a means of 'world-building' and the power of established narratives
- Questions of diversity and gender (in)equality

Material

- Pop-cultural representations of science, engineering and the humanities e.g. in *Prey* (2002), *Iron Man* (2008-2013), *The Martian* (2011), *The Chair* (2021), *Rocket Boys* (2022-2023)
- Different types of scientists in the film *The Core* (2003), the series *The Big Bang Theory* (2007-2019) and the card game *Arkham Horror* ("the scientist", "the laboratory assistant", "the astronomer") (2016-)
- EU Commission's STEM campaign video: https://www.youtube.com/watch?v=iuJ1zp-QT8o
- Geena Davis Institute: The Scully Effect: https://geenadavisinstitute.org/research/the-scully-effect-i-want-to-believe-in-stem/

Further reading

- Nieto, L. M. H., & Weingart, P. (2021). Between Mad and Mundane: Mixed Stereotypical and Realistic Portrayals of Science in Contemporary Fiction Media. In S. Farzin, S. M. Gaines, & R. D. Haynes (Eds.), *Under the Literary Microscope* (pp. 54–74). Penn State University Press. https://doi.org/10.1515/9780271090139-006
- Weitekamp, M. A. (2017). The Image of Scientists in The Big Bang Theory. *Physics Today, 70*(1), 40–48. https://doi.org/10.1063/PT.3.3427

Learning objectives

Students learn to identify and critically analyse common stereotypes of scientists and scholars in popular media, examining how tropes—from the "evil alchemist" to the "helpless scientist"—function as narrative devices in world-building. They compare media portrayals across disciplines—science in *The Martian*, engineering in *Iron Man*, humanities in *The Chair*—and formats, including series, films, novels and games. At the end of the session, students reflect on the role of gender, diversity and inclusion in science-related storytelling.

Suggested assignments

Imagine you had to film the next season of *The Big Bang Theory* and introduce a new character who represents your field of expertise. Write a brief description of this character: What is his/her name? What is his/her gender? What distinguishes him/her? Hobbies? Aspirations? Document your ideas.

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7. One Science, Two Cultures, or More?

The Unity and Plurality of Science

Content

- Traditional debates about the unity or disunity of science
- From "two cultures" to "three cultures" (natural sciences, humanities, social sciences)
- Beyond two or three cultures: The multitude of academic disciplines and speciality areas
- Other forms of plurality: methods, research tools, theories, paradigms, people and organizational contexts
- Sociological perspectives focusing on the plurality of science: Empirical observations reveal a multitude of activities, practices, cultures, and institutions
- Sociological perspectives focusing the unity of science: System-theoretical conceptualizations point to (one!) global system of knowledge production

Material

- A historical paper that shows how the Vienna Circle elaborated a vision of "unified science". For example, Neurath, O. (1937). Unified Science and Its Encyclopeadia. *Philosophy of Science* 4(2): 265-277.
- "Maps of Science" that illustrate the networks within and between different disciplinary cultures, using bibliographic data. See, for example, Börner, K. et al. (2012). Design and Update of a Classification System: The UCSD Map of Science. *PLOS ONE* 7(7): e39464 https://doi.org/10.1371/journal.pone.0039464

Further reading

- Galison, P. (1996). Introduction: The Context of Disunity. In P. Galison & D. J. Stump (Eds.), *The Disunity of Science. Boundaries, Contexts, and Power* (pp. 1-33). Stanford University Press.
- Cat, J. (2024, January 9th). *The Unity of Science. Stanford Encyclopedia of Philosophy*. Retrieved 2009-06-30, from http://plato.stanford.edu/entries/scientific-unity/
- Kagan, J. (2009). *The Three Cultures: Natural Sciences, Social Sciences, and the Humanities in the 21st Century*. Cambridge University Press.

Learning objectives

Students learn to distinguish between references to "science" in the singular and the empirical reality of "sciences" in the plural, critically examining how the notion of a unified scientific enterprise can obscure the diversity of disciplines, methods and institutional contexts. They will also explore the various ways in which the internal differentiation of the science system can be conceptualized—from classical debates about the unity or disunity of science and the "two" or "three cultures" model to system-theoretical and bibliometric perspectives that map the multitude of academic disciplines.

Suggested assignments

a) Make one list of arguments for the "unity of science", and another list for its "disunity".

b) Discuss the "geography" of the "maps of science" and explain how the different cultures relate to each other.

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8. How Do We Live and Work on Campus?

Ethnographic Perspectives on Science and Academic Cultures

Content

- An anthropological perspective: "Laboratory studies" as a tool to study the manufacture of "scientific facts"
- Two classic contributions by Bruno Latour ("The Social Construction of Scientific Facts") and Karin Knorr-Cetina ("The Manufacture of Knowledge")
- Discussion of ethnographic methodologies: what kind of fieldwork can be done in the lab as well as in other spaces of the university?
- Discussion of the notion of "context": e.g., context of justification versus context of discovery; local, national and global contexts of knowledge production

Material

- Cartoon by Mike Peyton ("The New Scientist"), which is printed in the front matter of Knorr-Cetinas (1981) book
- Visual material: university architecture, lab situations, libraries, campus design, etc.
- Popular series and films with a campus and/or laboratory set-up

Further reading

- Latour, B. & Woolgar, S. (1979). *Laboratory Life. The Construction of Scientific Facts*. (2nd edition 1986). Princeton University Press. https://doi.org/10.2307/j.ctt32bbxc
- Knorr-Cetina, K. (1981). *The Manufacture of Knowledge. An Essay on the Constructivist and Contextual Nature of Science*. Pergamon. https://doi.org/10.1016/C2009-0-09537-3
- Knorr-Cetina, K. (1995). Laboratory Studies. The Cultural Approach to the Study of Science. In S. Jasanoff, G. E. Markle, J. C. Petersen, & T. Pinch (Eds.), *Handbook of Science and Technology Studies* (pp. 140-166). Sage. https://doi.org/10.4135/9781412990127.n7

Learning objectives

Students familiarise themselves with an anthropological perspective on scientific "cultures," taking the notion of culture quite literally and employing ethnographic methods. At the end of the session, students will be able to turn this lens onto their own university environment—observing everyday practices in labs, lecture halls and communal areas and documenting them as "field notes" to reveal the hidden cultures of campus life.

Suggested assignments

Take the „laboratory studies" approach as an inspiration for ethnographic observation. During your time on campus/ at the university, what would you observe if you were not a student, but an anthropologist interested in the specific „culture" that is lived and practiced in these places? Make some „field notes" to document your observations.

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9. Humanities at Technical Universities?

The Two Cultures in Engineering Education

Content

- Shifting hierarchies of disciplines from the 19th to the late 20th century with regard to the change of epistemic ideals and societal expectations: from theory over practice, academic emancipation of the natural sciences, engineering as applied science, recurring crisis discourses of the humanities to application orientation in current "techno-scientific worlds"
- Changing roles of the humanities in engineering education in a diachronic perspective: ideals of general education, pedagogy and the training of teachers for technical professions, academic core skills, contextualising science and technology, ethics of science and technology
- Exploring cultural/national differences in implementing the humanities and liberal arts in study programmes at STEM-institutes in a synchronous perspective

Material

- Descriptions of humanities and liberal arts programmes from different technical universities, e.g.
  - Dietrich College of Humanities and Social Sciences at Carnegie Mellon University (https://www.cmu.edu/dietrich/academics/humanities/index.html)
  - "Studium generale"/General Studies at the Karlsruhe Institute for Technology (https://www.forum.kit.edu/english/13074.php)
  - Humanities and Social Sciences at BITS Pilani (https://universe.bits-pilani.ac.in/pilani/pilaniDepartmentofHumanitiesandSocialSciences/Courses)
- Historical documents or reports related to the role of humanities for engineering education, for example:
  - American Society for Engineering Education (ed.): Report of the Investigation of Engineering Education, 1923-1929, 2 vol., Pittsburgh 1930-1934.
  - -An Improbable Achievement: BITS- a Profile of Change. New Delhi: Wiley Eastern Limited. 1990. (the book is a compilation of essays by professors and administrators involved in the curricula related initiatives from 1964 to 1989)
  - BITS Bulletin: Years 2010-2011, 2012-2013 and 2023-2024 (https://academic.bits-pilani.ac.in/Institute_Important_Documents.aspx)

Learning objectives

Students gain awareness of the shifting hierarchies of disciplines within academia in the course of changing epistemic ideals, societal expectations and institutional priorities. They are enabled to reflect on the cultural and societal contexts that have shaped educational goals in higher education. Moreover, students will engage with the diverse—and sometimes conflicting—requirements placed on engineers and scientists beyond purely technical training.

Suggested assignments

a) Compare the range of humanities courses offered at your university with corresponding courses offered by two selected technical universities in other countries. Discuss the (cultural) differences and specific features.

b) Interview three fellow students or seniors from the natural sciences and engineering about their experiences and expectations with regard to additional humanities courses. Document your interviews by summarizing their key statements.

c) Sketch a future humanities' agenda for engineering education at your university while reflecting current professional and societal needs as well as cultural specifics.

Further reading

- Akera, A. (2011). Liberal Learning Revisited: A Historical Examination of the Underlying Reasons, Frustrations, and Continued Prospects for Engineering and Liberal Arts Integration. In: *2011 ASEE Annual Conference & Exposition*, 22–1015. https://doi.org/10.18260/1-2--18282
- Lehr, J. L. (2015). Co-Creating Liberal Studies in Engineering Program(s) – A Perspective from Ethnic Studies, Women's & Gender Studies, and Science & Technology Studies. *Engineering Studies, 7*(2-3), 123–125. https://doi.org/10.1080/19378629.2015.1062502
- Liao, C. (2016). From Interdisciplinary to Transdisciplinary: An Arts-Integrated Approach to STEAM Education. *Art Education, 69*(6), 44–49. https://doi.org/10.1080/00043125.2016.1224873

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10. Does Science and Technology Need a Philosophical Foundation?

Rethinking Philosophy's Unifying Role

Content

- Origin and emergence of Modern Science
- Philosophy as 'mother' of all subjects?
- Philosophy of Science: Issues related to definition, methodology, explanation, and purpose
- Science as Natural Philosophy?
- Technology as 'idea' and 'artefact'
- Who came first—science or technology?
- Philosophy of Technology: How technology re/shapes human destiny?

Material

- Hepburn, B. & Hanne, A. (2021). Scientific Method. *The Stanford Encyclopedia of Philosophy*, Edward N. Zalta (ed.). Available at: https://plato.stanford.edu/archives/sum2021/entries/scientific-method/
- Franssen, M., Gert-Jan, L., & Van de Poel, I. (2024). Philosophy of Technology. *The Stanford Encyclopedia of Philosophy*, Edward N. Zalta & Uri Nodelman (eds.). Available at: https://plato.stanford.edu/archives/fall2024/entries/technology/

Further reading

- Okasha, S. (2002). *Philosophy of Science: A Very Short Introduction*. Oxford University Press. https://doi.org/10.1093/actrade/9780192802835.001.0001
- De Vries, M. J. (2016). *Teaching About Technology – An Introduction to the Philosophy of Technology for Non-Philosophers* (2nd ed.). Springer. https://doi.org/10.1007/978-3-319-32945-1

Learning objectives

Students gain awareness of philosophy as the "mother" of all disciplines, tracing how its core questions gave rise to distinct scientific and technical fields. Furthermore, students examine diverse logical frameworks across cultures, comparing Western paradigms with non-Western reasoning traditions to uncover how underlying assumptions shape knowledge and practice. By the end of the course, they will be able to articulate philosophy's role in the emergence of various fields, analyze concrete interconnections between philosophical thought, science, and technology, and critically reflect on the logic underpinning different cultural worldviews.

Suggested assignments

a) Discuss, in groups, and write a paragraph on what makes science unique.

b) Identify and write two logical issues related to the 'two cultures' debate.

11. Ethical Issues of Technologies?

Interactions between Ethics and Technology

Content

- Definition of ethics
- Relevance of identifying ethical components in issues
- Relevance of improving ethical decision-making
- Introducing the arising ethical issues in technology
- Professional responsibilities of scientists and engineers
- Addressing the ethical issues holistically while designing, developing and implementing technology
- Values in technology - Are AI tools values-embedded?

Material

- Debate on technology and ethics in the article: Swierstra, T., Van De Bovenkamp, H., & Trappenburg, M. (2010). Forging a fit between technology and morality: The Dutch debate on organ transplants. *Technology in Society, 32*(1), 55–64 https://doi.org/10.1016/j.techsoc.2010.01.001
- Case studies: https://www.scu.edu/ethics/focus-areas/technology-ethics/resources/technology-ethics-cases/
- Space shuttle challenger disaster case (1986)

Further reading

- Rowan, J. & Zinaich, S. (Eds.). (2004). *Ethics for the Professions*. Wadsworth Publication.
- Chatfield, T. (2024). *Wise Animals: How Technology Has Made Us What We Are*. Picador.
- Biddle, J. B. (2023). Values in Artificial Intelligence Systems. In G. J. Robson & J. Y.Tsou (Eds.), *Technology Ethics: A Philosophical Introduction and Readings* (pp. 132-140). Routledge. https://doi.org/10.4324/9781003189466

Learning objectives

Students are expected to familiarise themselves with the definition of ethics and the significance of identifying ethical dimensions in technological, engineering and scientific endeavours. They will also explore emerging ethical challenges—ranging from debates on organ transplants to the Space Shuttle Challenger disaster—examining the professional responsibilities of scientists and engineers and learning how to address ethical issues holistically. At the end of the session, students would critically engage with the question of values in technology and the broader implications for future innovation.

Suggested assignments

a) Discuss the case of the Space shuttle challenger disaster in groups and identify the ethical issues.

b) Discuss the role of various stakeholders while developing a video game to ensure that the design is fair and meets ethical standards.