

The university in the Anthropocene

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Abstract

Purpose – This paper aims to reconsider the role of universities in the context of the grand challenges of the Anthropocene era, namely, climate change, biodiversity loss, ecosystems collapse, growing inequalities, welfare deficiencies and social unrest.

Design/methodology/approach – The paper uses the “idealized design” methodology, which suggests imagining what the ideal solution would be and then working backward to where the authors are today. In line with this methodology, the paper redefines the idea of the university in the context of the Anthropocene and analyzes the shortcomings of today’s universities. Then, it proposes a solution framework for transforming universities to become planet-positive institutions and discusses the internal and external barriers of this transformation.

Findings – This study advances a view of the university as an autonomous learning community and redefines its functions as follows: to generate an universal orientation across disciplines and cultures, to assist the whole person development of its members, to create a new holistic understanding of planetary challenges, including transdisciplinary codesigned, stakeholder engaged and solutions-oriented research, to bring forth responsible practitioners, to enhance the problem-solving capabilities of society and to catalyze progressive changes in human–Earth systems.

Originality/value – The paper presents examples of transformative university initiatives from the USA, Europe and India. It discusses the required changes in university actions, research and policy to cope with the new reality of the Anthropocene era.

Keywords The Anthropocene, Planetary challenges for the university, Whole person development, Transdisciplinary knowledge, Transformative university initiatives

Paper type Conceptual paper

1. Introduction: grand challenges of the Anthropocene and the universities

Knowledge has always been the driver of human progress. In the modern world, knowledge creation and sharing have been institutionalized in universities. From the 20th century, universities have sought to serve their communities by developing new scientific knowledge and evolving scientific systems and procedures for ensuring validity and replicability of knowledge claims. These institutions have also served the educational needs of their communities, seeking to create educated citizens employable in industry, government and other sectors of society.



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The changing needs of society now are dictated by the major discontinuity posed by the emerging “Anthropocene.” This era of Earth’s evolution is characterized by the great acceleration of global population and consequent impacts of human activities on Earth systems. We are at the verge of breaching planetary life boundaries and destabilizing Earth’s climate (Steffen *et al.*, 2018). Earth systems science view of the Anthropocene (Steffen, 2001) spawned a massive influence on historical (Chakrabarty, 2009), psychological (Adams, 2020), sociological (Ejsing, 2023) and anthropological (Latour, 2014), imaginations, analyses and theorizing. This era saw world population growth from about two billion in 1950 to over eight billion now, and expected to grow to ten billion as it peaks around 2050. To meet the needs of this growing population, a consumerist techno-industrial economic model has emerged that is clearly a threat to life systems. On the one hand, the global economy continues on an unfettered growth path that extracts the earth’s natural resources, degrading land and water, polluting the environment and resulting in the breaching of planetary life support boundaries and climate change (Rockström *et al.*, 2009). On the other hand, wealth produced in the global economy is distributed increasingly unequally among nations and among people within nations (Chancel *et al.*, 2022). The polycrises we now face in both ecological and social systems bring us close to tipping points of Earth systems collapse (Homer-Dixon *et al.*, 2021). The concentration of wealth in the hands of a few billionaires makes it difficult to reverse the economic trajectory away from collapse to a well-being economy for the common good (Dixon-Decleve *et al.*, 2022; Wironen and Erickson, 2020). In light of these profound changes in earth and socioeconomic trends, it is reasonable to ask whether universities as we have inherited them, are adequate to meeting the challenges of the Anthropocene.

Our concern is that the historical role of universities as “producers” of knowledge and “educational disseminators” is inadequate in the Anthropocene era, where problems are accumulating much more rapidly than they are solved. Universities need to be more involved in implementing solutions. Moreover, the mode of knowledge production by scientists isolated in universities, then passing that knowledge for “application” to agents/actors in the real world is being challenged. There are demands for the coproduction of knowledge with stakeholders and users to improve the rates of knowledge utilization and reduce the gap between knowledge production and use. Dissemination of knowledge in traditional educational formats, which is an important legacy function of universities, is inconsistent with modern trends in information dissemination among digital natives. So, it is appropriate to question the role that universities could play in the future to meet human challenges (Bengtson *et al.*, 2021; Kopp, 2021).

There are many specific challenges posed to universities by the Anthropocene. How can universities aid the holistic and integrated development of humans and nature? How can they produce global transdisciplinary orientation and integration across disciplines and cultures needed to solve planetary-scale challenges? How can they create responsible citizens and enhance the problem-solving capabilities of societies to catalyze improvements in the human–Earth systems? How can they bring about progressive changes in earth systems?

These questions bring into focus the role of universities in the Anthropocene. The UN Agenda 2030 proposes one approach to creating sustainable solutions for this coming era. Despite its many limitations, this agenda can serve as a basis for identifying knowledge gaps in different domains. More importantly, one of the sustainable development goals (Goal #4 – ensure quality education for all) proposed by the agenda is also an opportunity for self-reflection about what education means for sustainability and what sort of institutions can deliver it effectively.

There are many publications on universities in relation to sustainability and climate change (e.g. [Wals and Jickling, 2002](#); [Lotz-Sisitka et al., 2015](#); [Chankseliani and McCowan, 2020](#); [Facer and Newfield, 2022](#); [Alexander, 2023](#); [Starik and Shrivastava, 2024a, 2024b](#)) but these publications usually discuss only some aspects of the university functioning to cope with the grand challenges of the Anthropocene. Our paper aims to fill the gap in the literature by taking the radically new reality of the Anthropocene in its totality and addressing all the important aspects of the functioning of the university to become transformative, planet-positive institutions in the 21st century.

We use the so-called “idealized design” methodology developed by Russel [Ackoff \(1974\)](#). The idealized design methodology suggests to imagine what the ideal solution would be and then work backward to where we are today ([Ackoff et al., 2006](#)).

In line with the idealized design methodology, we redefine the functions of the university in the context of the Anthropocene and analyze the shortcomings of today’s universities. Then, we propose a solution framework for transforming the universities to become planet-positive institutions and discuss the internal and external barriers of this transformation. Finally, we make suggestions for university actions, research and policy.

The discourse about the role and functions of the modern university traces back to the early 19th century when William von Humboldt established the University of Berlin:

Intellectual freedom in research and teaching, university autonomy, the growth of independent disciplines with their own standards and priorities, and a kind of cosmopolitanism established the parameters of the university as a liberal institution ([Peters and Barnett, 2018](#)).

The English school of thought represented by John Henry Newman and others put a priority on the cultivation of the individual person centered around the literature as the central discipline of the university. The American tradition focuses on service to society, “general education,” active learning orientation and supporting economic and social development. Finally, the French tradition can be characterized as the postmodern tradition championed by Jean-Francois Lyotard and other postmodern philosophers. This tradition emphasizes the radically changed nature and form of knowledge in today’s society ([Peters and Barnett, 2018](#)). [Sørensen \(2019b\)](#) suggests that we should also consider the Spanish tradition represented by Ortega y Gasset, who argued for a university in the service of a modern republican state.

This paper mainly follows the American pragmatic tradition because the problems of the Anthropocene require urgent actions. We do not deny the importance of the other traditions, but integrating them into a coherent conception would need a book length treatment. However, we have already made some initial efforts to integrate the German concept of “Bildung” and the French concept of “enlivenment” into business education and sustainability education ([Küpers et al., 2024](#); [Persson et al., 2021](#)).

2. The functions of the university in the Anthropocene

2.1 From knowledge transfer to transformative learning

The notion of “university” is derived from the Latin term “universitas,” meaning a whole or the universe. To be true to their name, universities need to look at the whole planet, the whole of humanity and the whole person, which is well aligned with the Anthropocene.

We argue for a learning centered definition where the fundamental role of the university is not the transfer of existing knowledge but providing rooms for deeper, transformational learning to enable both students and faculty to tackle the messy, wicked problems of the Anthropocene. Also, we discuss the main shortcomings of today’s university functioning,

including the narrow focus on disciplinary boundaries and resistance to integrate different forms of human knowledge beyond science and technology.

In 1970, systems theorist and futurist Erich Jantsch wrote:

In response to various pressures for change arising from the present situation, the university will have to adopt a new purpose which may be recognized as a means of increasing the capability of society for continuous self-renewal (Jantsch, 1970: 403).

The Anthropocene calls for reconsidering the functions of the university.

The Anthropocene demands us to learn together how to live and act in a radically new context of a climate altered and AI mediated world. Consequently, we suggest the following working definition: the university is a free community of learning (students and faculty) to create new things. In this view, not knowledge transfer but learning is at the center of the functioning of the university.

In a general sense, learning can be understood as adaptation of the individuals, groups or societies in a changing environment to survive and flourish. Anthropologist and ecologist Gregory Bateson (1972) suggested this conception of learning.

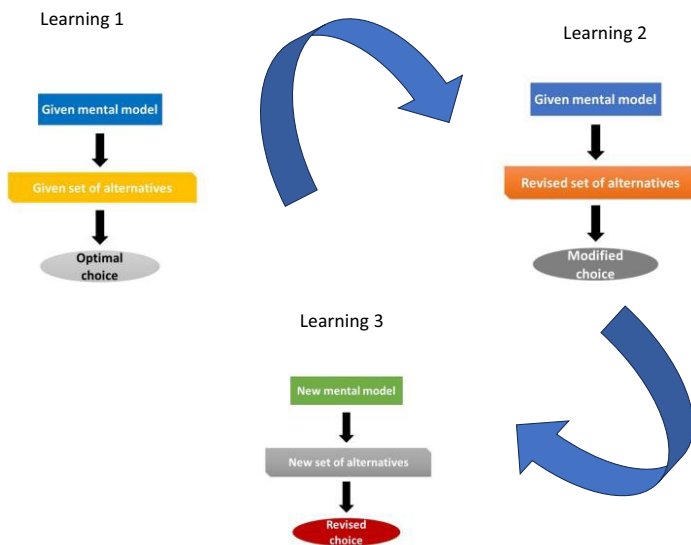
Bateson differentiated among three levels of learning. Learning 1 is based on experiences from the past, driven by an underlying mental model and controlled via a goal and the resulting outcome. The learning outcome is knowledge about the optimal choice in a static set of alternatives. Learning 2 is the revision of the set of alternatives from which the choice is made. It is based on past experiences and driven by an underlying mental model but in a changed and extended set of alternatives. Learning 3 is a corrective change in the system of sets of alternatives from which a choice is made. The focus is on the underlying mental model, which is strongly connected to a set of underlying needs and values (Kaiser, 2018) (see Figure 1).

Economics education is a good example to illustrate the differences among the three levels of learning. Teaching mainstream economics represents Learning 1. Economics and business students are introduced to the basic model of Homo Economicus, which assumes that economic agents are rational, self-interest-maximizing beings. Also, students get to know profit maximization, economic efficiency and economic growth as the main goals of economic action and policy.

Introducing new findings of behavioral economics or neuroeconomics in economics education represents Learning 2. In these approaches, the underlying mental model of economics is not changed but new social and behavioral aspects and elements are added to economic analysis. Finally, teaching more holistic, ethical, social and ecological models of economics represents Learning 3. These models already change the underlying mental model of economics by redefining economics as a science of the livelihood (work) of people, capturing the full spectrum of human existence, considering the whole economic system, acknowledging the intrinsic value of nature, promoting frugal production and consumption, making room for ethics in economic coordination mechanisms, reinforcing the intrinsic motivation of people and developing holistic measures of value and well-being (Gerold *et al.*, 2023; Zsolnai, 2022).

We are not arguing that mainstream theories of science and technology should not be taught at universities. But we argue that learning should not stop there. The new reality of the Anthropocene requires the disciplines and the professions to move from Learning 1 and Learning 2 to Learning 3. This move involves some deeper transformation of the mindset of both faculty and students.

The age-old name and symbol of the university is “Alma Mater.” It literally means “nourishing mother.” To serve the flourishing of life (human and nonhuman, present and



Source(s): Authors' creation

Figure 1. Three levels of learning

future), universities should become institutions of transformational learning, that is, places which provide rooms for learning, unlearning and relearning the identity, values, norms, models, skills and behaviors related to the disciplines and the professions in the context of the Anthropocene.

2.2 The shortcomings of today's universities

The Anthropocene presents messy, wicked problems in enormous magnitude and scale, including climate change, biodiversity loss, ecosystems collapse, welfare disfunctions and global inequality.

Founder of operations research, Russell Ackoff (1974) introduced the term “mess,” referring to a class of problems in which every problem interacts with other problems and is part of a set of interrelated problems. In addition to that, wicked problems are characterized by having no definitive formulation, no stopping rule for solving them, no ultimate test of a solution, essential uniqueness and vital importance; that is, the problem solvers have no right to be wrong (Rittel and Webber, 1973).

Today's universities work within disciplinary boundaries and educate students to follow the given rules and models of the disciplines. However, tackling the messy, wicked problems of the Anthropocene requires going beyond disciplinary boundaries, reconsidering the basic assumptions of the system under study, taking multiple value perspectives, including as many stakeholders' views as possible, and using all types of human knowledge, including the arts, humanities, non-Western and Indigenous cultures and practical lay experiences.

An illustrative example of the messy, wicked problems of the Anthropocene is as follows.

In the Anthropocene, we will need to provide food, water, energy, shelter, etc., for ten billion people on earth by 2050. Today, these topics are related to the agriculture discipline,

the geological and meteorology disciplines, the engineering disciplines and the urban studies discipline. However, we understand now that food production requires energy and water, energy production requires food and water and water delivery requires energy and food for people. The interconnections among these elements are deep, complex and sometimes conflicting. We need to understand the holistic nexus of food-water-energy-shelter to deal with this challenge in practical terms.

Students who study at universities these days will live and work in the next 50 years. The Anthropocene requires thinking about the sustainability and flourishing of all life and the well-being of humanity over decades and centuries.

Training in disciplines often forces today's students to solve the wrong problems precisely. Harvard decision theorist Howard Raiffa labeled the error of solving the wrong problem precisely as the "Error of the Third Kind" (Keeney and Raiffa, 1976). Focusing on the scientific-technical aspects of problems and disregarding the interpersonal-social, systemic-ecological and existential-spiritual aspects, university graduates can easily commit the Error of the Third Kind that can worsen the problem situation (Mitroff, 1998; Zsolnai, 2020).

Business education is a case in point. Contrary to some innovative and noble efforts to change business school education, mainstream business curricula all over the world still promulgate a distorted view of human nature (humans are motivated solely by greed and purely opportunistic), a narrow and outdated notion of ethics (materialistic egoism) and a limited definition of management (management is about making money and can be captured solely in economic terms) (Mitroff, 2004). This is a clear recipe for catastrophe, considering the important role that business graduates will play in the future.

It is timely and important to propose innovative solutions for universities because we are at a discontinuity in the role and formation of knowledge in societies. Knowledge creation and dissemination is challenged by multiple versions of truth. The knowledge that science has produced over the past 75 years has been helpful in understanding and measuring the sustainability problems we face, but virtually every sustainability variable (carbon emissions, deforestation and pollution) has deteriorated during this period. We urgently need knowledge that not only explains problems but also develops actions that solve them.

We will present some directions for universities to transform themselves into progressive change agents in the Anthropocene (Shrivastava, 2020).

3. How can universities become planet-positive in response to the global sustainability challenges?

In 1605, Sir Francis Bacon published his book "The Advancement of Learning," which is considered as a beginning of modern science and technology. Bacon envisioned a great synthesis of human knowledge that each discipline might benefit from the discoveries of the others. We believe that the Anthropocene requires new steps in the advancement of learning, and universities should play a crucial role in this development. We aim to complement the work on "Ecological University" (Barnett, 2018), which claims that not only the operations but also the spirit of the university should be ecological.

Our proposed solution framework indicates the steps that we suggest. Here we take an "outside-in" approach and consider the university as an integrated managerial unit. We are well aware of the importance of the "inside-out" approach, which builds on academic freedom and citizenship of faculty and students (Sørensen, 2019a). We have discussed promising initiatives of this kind in teachers education, health-care education, business and economics education and architecture education elsewhere. (Zsolnai et al., 2025).

3.1 The proposed solution framework

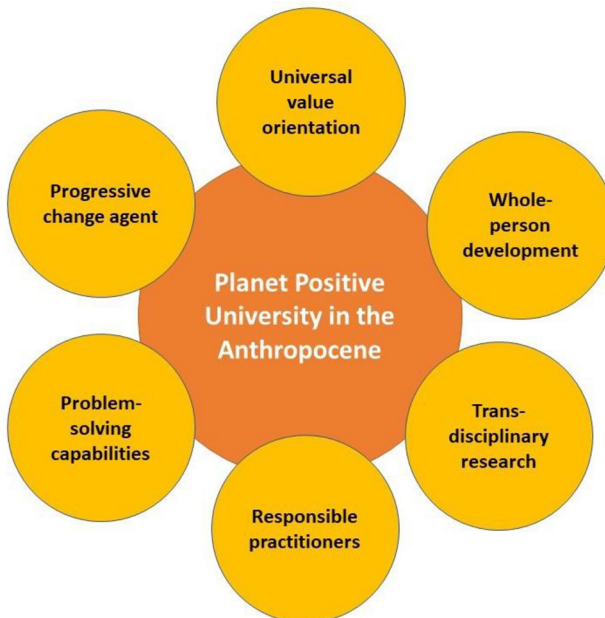
To address the challenges to universities posed by the Anthropocene, we propose to frame the primary functions of the university in the Anthropocene as follows:

- to generate an universal orientation across disciplines and cultures;
- to assist the whole person development of its members;
- to create new forms of knowledge, including transdisciplinary, stakeholder engaged and solutions-oriented research;
- to bring forth responsible practitioners;
- to enhance the problem-solving capabilities of society; and
- to catalyze progressive changes in the human–Earth systems (Figure 2).

We envision universities that help students, faculty and communities to renew their disciplines and professions for serving the flourishing of life on Earth (human and nonhuman, present and future) (Dixon-Declève *et al.*, 2022).

3.1.1 Universal value orientation. The term “university” indicates an universal orientation across disciplines and cultures, but today’s universities are stuck to a specific cultural tradition, namely, the modern Western worldview. It is a question that, with its strong materialist and reductionist ontology and epistemology, the modern Western worldview is appropriate to tackle the deep ecological, social and technological problems of the Anthropocene.

For survival and flourishing in the Anthropocene, humanity needs to adopt an ecological worldview that differs from the modern Western worldview. David Korten argues that:



Source(s): Authors' creation

Figure 2. Functions of the university in the Anthropocene

Humans are a choice making species with a common future faced with an epic choice. We can continue to seek marginal adjustments in the culture and institutions of the Imperial Civilization of violence, domination, and exploitation that put us on a path to self-extinction. Or we can transition to an Ecological Civilization dedicated to restoring the health of living Earth's regenerative systems while securing material sufficiency and spiritual abundance for all people (Korten, 2022).

We propose that universities should provide opportunities for students and faculty to become familiar with the worldviews of non-Western cultures, including Indigenous worldviews. To renew the current mental models of the disciplines and the professions and to contribute to the ecological transition of our societies, students and faculty should study the most important achievements of human cultures across history and geography. Encounters with non-Western mental models can boost creativity and inspire radical innovation. Also, it is in line with the postcolonialist movement that wants to make justice for non-European people, their history and their land. American and Canadian universities started to recognize the heritage of Indigenous people who lived in the land where the universities are currently staying. This is an important first step in the right direction.

Global cultural studies can be a good starting point toward going beyond the "iron cage" of efficiency, rational calculation and control of the modern Western worldview (Lassman, 1994) and developing a truly universal value orientation at our universities. Some universities offer courses and programs that focus on the interconnected elements of diverse world cultures, their social structures, rituals, health practices, languages, literature, art and history. A comprehensive overview of the different mental models of human cultures (past and present) can serve as a major source and inspiration for transformative learning.

3.1.2 Whole person development. Today's universities favor a rather one-sided education focusing on the cognitive-intellectual development of the students. However, human flourishing and the ecological regeneration of the Earth require a much broader, more holistic education that assists whole-person development.

Whole-person development involves nurturing all the relevant aspects of the person, from the physical and social to the emotional and spiritual. Holistic education aims to develop the head, the heart and the hands of the person in a concerted way. Not only knowing science and technology are important in this process but also nurturing the arts, community, nature and spirituality (Ivanaj *et al.*, 2014).

The status of the humanities in the universities is much debated today. Martha Nussbaum (2016) forcefully defends the value and the necessity of the humanities within the university system. She emphasizes the vital role of the humanities in the formation of knowledgeable, productive and empathetic individuals who are able to criticize authority, develop sympathy with the marginalized and different and have competence to deal with complex global problems. Michael Thate (2023) aptly characterizes the position of the humanities by the term "the utility of irrelevance." The humanities may encourage students and faculty to doubt, criticize and dissent for the sake of pro-social outcomes. For transformational learning, the value of the humanities cannot be underestimated.

Nobody can question the importance of the arts in human development, but – except art education – the arts are not often used as a means and an approach in today's university education. In our days, the arts are not seen as a relevant form of human knowledge in comparison with modern science and technology. Rather, the arts are often considered as means for enjoyment whose purpose is nothing more than mere entertainment. But philosophers, including Heidegger (2008) remind us that art is a fundamental form of self-expression and self-interpretation of human communities. As such, the arts have enormous transformative power for human development.

We suggest that various forms of the arts, including visual arts, literature, psychodrama, dance and performance and music, should be used in universities for facilitating transformational learning as they can provide “out of the box” thinking and often challenge the current mental models of the disciplines and the professions.

A notable case of using the art for larger social purposes is the work of the celebrated artist Joseph Beuys. He – as professor of monumental sculpture at the Dusseldorf Academy of Arts – revolutionized education. He developed the idea of “social sculpture” that could reshape society and politics. With his students and colleagues, Beuys initiated major eco-political changes in Germany and beyond, including establishing the first-ever green party, “Die Grünen.”

Extracurricular activities also provide excellent opportunities for whole-person development. When students (and faculty) connect themselves with meaningful community projects and achieve creative things together, then the transformational effect of these activities is almost sure. One interesting example of such an extracurricular activity is the “Dans la rue” (On the Street) project organized by students at Concordia University in Montreal ([Concordia University, 2019](#)). In this project, students voluntarily live together with homeless people for five days in downtown Montreal, sometimes under extreme weather conditions (–2°C in wintertime). They share the life of the homeless and organize public activities related to homelessness.

Another meaningful example is the construction of a solar school by Hungarian university students in Zangla, Ladakh, in India. In this project initiated by the [Csoma’s Room Foundation \(2023\)](#), architects and students work with local people in the Himalayas (around 3,500 meters high) to build a 100% renewable energy school for the village community that combines local knowledge with advanced Western technology and use only local materials.

3.1.3 Transdisciplinarity and new forms of knowledge. Human knowledge, developed over 400 years of evolving disciplinary norms, has become exceedingly fragmented (over 10,000 recognized disciplines). Disciplinarily siloed knowledge is not adequate at a time when we need planetary-scale holistic understanding of the Earth and social systems. To address the wicked and messy problems of the Anthropocene, we need integrated and unified ways of knowing, combining natural sciences with social sciences, the humanities, the arts, traditional knowledge systems and faith-based knowledge.

We use the term “transdisciplinary” knowledge to represent many forms of knowledge unification across disciplines, action realms and lived experiences of life forms. It includes codesign and coproduction of knowledge with stakeholders to solve real-world problems. Transdisciplinarity also holds open space for emotional, spiritual and “artificial” intelligences among the new forms of knowledge ([Kaiser and Gluckman, 2023](#)).

Since the 1970s, some universities have experimented with expanding beyond disciplinary siloed tendencies by engaging inter-, multi- and pluri-disciplinary approaches to research. Transdisciplinarity not only builds on that impulse of integrating across disciplines. It represents a discontinuity that favors action, results and impacts on the problems facing us ([Shrivastava, 2020](#)). Beyond research, we have seen the expansion of transdisciplinary approaches to teaching and learning in the form of experiential and embodied learning, project-based learning, nature pedagogies and participative or engaged learning ([Dewey, 1938](#)). In recent years, there have been several notable attempts at structural transformation toward transdisciplinary thinking, action and engagement at universities, like Leuphana University in Germany and Arizona State University ([Crowe and Dabars, 2015](#)).

3.1.4 Responsible practitioners. Hans Jonas’ ethics, called “The Imperative of Responsibility” ([Jonas, 1984](#)), promotes prospective moral responsibility as a response to the challenges of modern technology. He defines responsibility as a duty in caring for the beings

affected by one's actions and policies. The beings to be considered may include human persons, social communities, nonhuman creatures, ecosystems and future generations.

Jonas argues that we should seek:

[...] not only the human good but also the good of things extra human, that is, to extend the recognition of 'ends in themselves' beyond the sphere of man and make the human good include the care of them (Jonas, 1984: 7–8).

He suggests that the imperative of responsibility might run like this. "Act so that the effects of your action are compatible with the permanence of genuine human life." Or expressed negatively: "Act so that the effects of your action are not destructive of the future possibility of such life" (Jonas, 1984: 11).

Jonas' imperative can be applied to all professions. Practitioners cannot ignore the direct effects and longer-term consequences of their actions on human communities, the natural environment and future generations. To bring forth responsible practitioners of this kind implies that universities should reconsider and renew the professional profiles of their graduates. This is a long and painful process but universities should prepare their students for living and working in the worsening environmental and social conditions of the Anthropocene.

Guimay and Rendtorff (2024) emphasize the obligation of researchers to be public intellectuals in democratic societies. The idea of the public intellectual proposed by Hannah Arendt can contribute to the justification of the protection of academic freedom and the ethical responsibility of science in society. Rendtorff (2019) discusses the responsibility of the business and management professions for sustainable development in the conditions of the Anthropocene.

3.1.5 Problem-solving capabilities of society. Societies invest into knowledge production and dissemination for the pragmatic purpose of improving their abilities to solve their own problems. Modern societies were made possible by and largely shaped by scientific, technological and other forms of knowledge. Well informed citizens were crucial for the economic, political and cultural success of societies. However, solving the messy, wicked problems of the Anthropocene demands more than just having knowledge. First, knowledge needs to be actionable, and it needs to be in the hands of people and institutions that are able to act. And second, the urgency of Anthropocene threats such as climate change means actions need to be implemented at a planetary-scale within a relatively short window of opportunity (of a few decades).

Historically, universities have excelled in producing knowledge. They have generated huge amounts of scientific, technological, economic, social and cultural knowledge. However, they have not been as successful in translating this knowledge into actions and impacts. In fact, researchers do not see themselves primarily as implementers of solutions. They are not held responsible for actions or results. Those actions and solutions are seen as the job of practitioners, managers and policymakers. Many universities have "extension" programs in agriculture or health sciences, and community outreach programs, even public media assets. These could be leveraged to build societal problem-solving capabilities.

AI is a technology that is here and transforming some basic processes of learning, work, interactions and problem-solving. It is also pervasive across many sectors of society. We need to harness this capability before it becomes capable of harming humans (Hatamleh and Tilesch, 2020). Universities can play a decisive role in using AI in ethical ways and promoting it for human well-being and ecological regeneration purposes.

3.1.6 Progressive change agents. Universities are well-positioned to catalyze progressive changes in their respective society. As institutions of knowledge and learning,

they have the expertise to solve problems and usher in social progress. Compared to other institutions of change, such as political actors, businesses, and even health-care systems, universities are more trusted by communities as honest knowledge brokers and ethical actors. However, most universities do not perceive it as their role to bring about progressive changes in earth systems.

In addition to playing a proactive role as change agents, universities also need to help refine what progress means in the future. One of the most profound discontinuities revealed by the Anthropocene is in the notion of progress. What we had imagined to be indicators of progress, such as economic growth as measured by GDP, individual wealth, technological advances, are not necessarily so. Pursuing progress as we have in the past three centuries has brought humanity and earth systems to our current predicament. We cannot continue to progress in the same direction. Since the challenges of the Anthropocene are planetary in scale, progress, too, needs to be imagined at a collective planetary scale. We need an inclusive vision of progress for ALL humans and life forms, reflecting a long-term balance of nature and humans.

3.2 Internal and external barriers of transformation

Our proposed solutions above are challenged by several historical and structural conditions prevalent at modern universities. Among the internal and external barriers of transforming universities into creative institutions, we highlight four main ones – structures, reward systems, business models, funding and academic cultures. These could be adjusted to fit the reality of the Anthropocene and indicate ways forward.

First, universities are structured as research and teaching entities, and research and teaching are structured by disciplines. Problems of the Anthropocene are messy and wicked and not responsive to these historical structures. By loosening the existing structures and making space for action-oriented alternatives, universities can be more responsive to the needs of their communities.

Second, faculty performance assessment and reward systems at universities are heavily focused on research publications and grant funding and, to some degree, on quantity and quality teaching. To serve a wider purpose in society, faculty need to be rewarded for their services toward making their communities resilient and sustainable.

Third, universities depend heavily on government funding or tuition revenues from students to fund their work. With most governments at all levels running deficit budgets, there has been a continual shrinkage in public funding for education. Tuition revenues have come under pressure with the changing population of college students and the affordability of university education. Universities would be well served by developing new business models, new modes of value creation and new sources of funding.

Fourth, academic cultures within universities, shaped by disciplines-based values and mature institutions, do not encourage innovation, entrepreneurship and taking responsibility for new challenges facing communities. As a result, universities are resistant to large visionary changes and are more comfortable with minor incremental changes or even stagnation – clearly not suited to the monumental demands of the Anthropocene.

3.3 Good examples

[Starik and Shrivastava \(2024a, 2024b\)](#) propose the so-called ROOTS model for transforming universities to contribute positively toward global sustainability. The elements of the model are research (R), operations (O), outreach (O), teaching (T) and students/stakeholders (S).

No university, in our view, currently pursues all the elements noted above in a holistic manner. However, some universities are seriously implementing one or another of these

elements which we use as good examples for going forward. The university functions of research, education, student life, community engagement and physical operations can all be repositioned to make the carbon neutral, socially just path and contributing to the flourishing of local communities. We illustrate these possibilities with examples of what universities are already doing and point to future possibilities.

We use examples of universities that make promising steps toward redefining their role in the Anthropocene. Many universities around the world have responded to climate change by adopting zero-carbon goals (UNEP, 2021). In the USA, many universities made commitments to social justice through diversity, equity and inclusiveness programs.

The Visva-Bharati University (West Bengal, India) focuses on the whole-person development of students and faculty through arts, community, nature and spirituality by using the head, the heart and the hands. Poet and philosopher Rabindranath Tagore founded the University. Its most famous graduates include Nobel prize-winning economist Amartya Sen and Indira Gandhi, former Prime Minister of India (Visva-Bharati, 2023).

The Schumacher College in Devon, UK, is another example of a whole-person development institution dedicated to progressive social change and ecological studies. The college is renowned for its experiential approach to learning, focusing on developing practice-based skills of the students that support biodiversity and nature connection. Its courses combine personal transformation and collective action through the education of head, heart and hands: students do manual labor in the land of the college in addition to intellectual activities (Schumacher College, 2023).

At Arizona State University, the Office of the President established a major project called “The New American University.” Arizona State University introduces eco-literacy and sustainability courses as requirements for graduation so that every student in every field should know how the planet works and why this is important for their own lives and careers (Crow and Dabars, 2023).

Figure 3 summarizes some key opportunities for transformative learning at universities.

4. Suggestions for university actions, research and policy

Universities can undertake several actions to transform themselves toward planet-positive impacts. One place to begin is with a serious self-examination audit to understand what functions they are performing well, the gap areas for them to focus on and identifying low-hanging fruit they can implement quickly. Such audits can build upon a variety of self-studies that universities normally do for accreditation purposes, for periodic institutional performance assessment or to fill out rankings surveys. The purpose of such self-examination should be on purpose and mission, not on operations and results. It should seek to answer the fundamental question of – are we doing the right things to meet the challenges of the Anthropocene.

A second useful action is integrating the results of self-examination and other institutional assessments into institutional strategic planning processes. Many universities have participated, and stakeholder-engaged strategic planning processes in place. If they do not, then creating such a process is necessary. Strategic planning can bring legitimacy and wide participation and shape the culture of the institution, facilitating changes and implementation of new directions.

The deep changes implied by redirection of purpose often require significant new investments and mobilization of resources (human, financial and knowledge). This may require the development of new research programs, identifying potential sponsors and funders, new advisors and opinion shapers.



Source(s): Authors' creation

Figure 3. Key opportunities for transformative learning at the universities

Another important direction for universities to move in is opening up to meaningful stakeholder engagement, especially earth systems and socioeconomic changes within communities. Universities are thought of as “ivory towers” disengaged from problems of the real world. Citizens perceive them to be elitist, opaque, not user-friendly and hard to engage with. Universities can gain a better and continually improving understanding of the common good by understanding and engaging “common persons.” Community outreach and engagement, often a relatively minor (compared to research and teaching) function in universities, needs to be lifted up and valorized to make engaged scholarship and teaching community-centric.

From a policy perspective, we feel that funding agencies and foundations that support the work of universities can boost the changes by acknowledging the necessity and desirability of changes. For example, science funding agencies could insist on research studies having a deep transdisciplinary dimension. They can develop standards and assessment criteria for ensuring the codesign of research problems, coproduction of knowledge with stakeholders, impact on real-world problems and contributions to the overall sustainability of communities, regions and nations.

5. Conclusions and limitations

This paper reconsidered the role of universities in the context of the grand challenges of the Anthropocene era and outlined the ways universities can respond to these challenges. We are well aware of some limitations of our study.

First, our paper is focused on North-American and European universities. It would be important to extend the geographical and cultural scope of the study and to include Asian, African, Latin American and other universities in the inquiry.

Second, the paper belongs to the American pragmatist tradition represented by John Dewey, West Churchman, Russel Ackoff, Donald Schön and others. We would welcome other inquiries based on different traditions (German, French, British, etc.). To create adequate and creative responses to the unprecedented challenges of the Anthropocene era requires an open dialogue among diverse traditions and paradigms in understanding the essence and functions of the university in context.

Third, the paper used an “outside in” perspective on the university in relation to its external social and ecological environment. We think that taking an “inside out” perspective is also necessary. Autonomy and academic freedom in science and scholarship are fundamental values, so another viable strategy is to collect and connect “bottom up” initiatives of faculty and students for renewing university functioning. At our own universities in the USA and Europe, we have already organized such dialogue forums for collaboration and cocreation.

To transform today’s universities into planet-positive institutions is a monumental task. However, universities have enormous intellectual power and considerable moral capital that make this transformation hopeful. In this way, universities can (re)gain their position as the guardians of humanity.

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