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Foresight Methods for Sustainability in Higher Education

The paper provides an overview of foresight methods, highlighting their significance in the context of sustainability and their applicability within higher education. Foresight methods are strategic approaches that assist in anticipating and preparing for the future, enabling stakeholders to make informed decisions and shape desirable outcomes. In the context of sustainability, these methods play a crucial role in identifying emerging trends, risks, and opportunities, and guiding the development of sustainable strategies and practices. The paper emphasizes the relevance of foresight methods in higher education institutions. It explores how these methods can be effectively utilized to enhance strategic planning, curriculum development, research prioritization, and institutional transformation towards sustainability. Foresight methods provide a structured framework for analysing and addressing complex sustainability challenges, enabling higher education institutions to anticipate and *respond to changing societal needs and global trends.*

Keywords: foresight methods, sustainability, higher education

Metode napovedovanja za trajnostni razvoj v visokošolskem izobraževanju

V članku so predstavljene metode napovedovanja v kontekstu trajnosti in njihova uporabnost v visokošolskem izobraževanju. Metode napovedovanja pomagajo pri pripravi na prihodnost ter omogočajo sprejemanje premišljenih odločitev in oblikovanje želenih rezultatov. V kontekstu trajnosti imajo te metode ključno vlogo pri prepoznavanju trendov, tveganj in priložnosti. V članku je izpostavljen njihov pomen na področju visokošolskega izobraževanja. Predstavljeno je, kako je mogoče te metode učinkovito uporabiti za izboljšanje strateškega načrtovanja, razvoj učnih načrtov, določanje prednostnih nalog raziskav in institucionalno preoblikovanje v smeri trajnosti. Metode napovedovanja zagotavljajo strukturiran okvir za analizo in obravnavanje zapletenih izzivov trajnosti, kar visokošolskim ustanovam omogoča predvidevanje in odziv na spreminjajoče se družbene potrebe ter globalne trende.

Ključne besede: metode napovedovanja, trajnostni razvoj, visokošolsko izobraževanje

Introduction

Since the 1950s, there has been a noticeable increase in human activity in numerous locations. Global growth has reduced the amount of natural resources needed for expansion. The term 'the great acceleration' describes both the speed of development and the rapid depletion of natural resources. In the model with the same name, twelve socio-economic megatrends and twelve ecological megatrends are compared. Since 1950, these indicators have revealed a significant relationship between changes in the Earth's systems and economic progress. This suggests that significant changes in the Earth's systems have been caused by human-induced development (Steffen et al. 2015).

The great acceleration has led to an enormous demand for natural resources. Coal deposits took

several million years to develop and have been declining rapidly since the 18th century. Humanity is using resources faster than they can grow back. This rapid growth has a number of consequences for us. Let us list just some of them (National Intelligence Council 2012).

1. *Social inequality*: The richest one percent of the world's population owns more wealth than the other 99% combined. In 2002 the proportion was 43%.
2. *Water and food:* 40% more water and 35% more food will be needed in 2030.
3. *Economy:* Economic growth in emerging markets will lead to more technological innovation worldwide.
4. *Migration:* In the next 30 years, 200 million climate refugees will be threatened; currently, there are 20 million.
5. *Urbanization:* In 2005, 49.1% (4 billion people) of the world's population lived in cities. By 2030, this share is predicted to reach 60% (4.9 billion people).
6. *Growth of population:* In 2020 (as of August), there are 7.8 billion people living in this world; in 2030 there will be 8.3 billion people.

Foresight methods are closely tied to sustainability because they provide helpful tools for understanding, forecasting, and influencing the future in a way that supports sustainable development. They are strategic techniques that aid in planning and foresight, giving stakeholders the power to make informed decisions and shape desired outcomes. These methods are crucial for identifying emerging patterns, risks, and opportunities in the sustainability environment as well as for guiding the development of sustainable plans and practises. Higher education institutions can anticipate and adjust to changing social demands and global trends by using foresight approaches because they provide a systematic framework for studying and addressing complicated sustainability issues.

In the following sections, we will highlight the significance of foresight methods in the context of sustainability and their applicability within higher education. We will introduce key connections between foresight methods and sustainability and explore how these methods can be effectively utilized to enhance strategic planning, curriculum development, research prioritization, and institutional transformation towards sustainability.

Foresight Methods for Sustainability

Foresight techniques are crucial for predicting the future and making plans in a wide range of industries. These methods comprise a range of methodical techniques, tools, and procedures that help people, groups, and society comprehend likely future events, challenges, and opportunities.

Fundamentally, foresight methods aim to advance beyond traditional forecasting by considering a diversity of plausible future outcomes rather than a single conclusion. As a result, stakeholders are better equipped to make informed decisions and take preventative action by helping to spot new patterns, forces of change, and potential disruptions.

Foresight strategies are used in many academic and industrial domains. They assist business and industry with strategic planning, product development, and innovation by identifying new markets, consumer trends, and technological advancements. In governance and policymaking, foresight approaches support long-term planning, policy development, and risk management. In fields including science and technology, education, healthcare, environmental sustainability, and social development, a proactive approach to forecasting and influencing the future is essential. Foresight is advantageous in each of these fields.

These methods include concepts from a wide range of various disciplines, such as scenario planning, futures studies, expert consultations, trend analysis, simulation modelling, horizon scanning, and more. According to the objectives, surroundings, and resources at hand, certain methods are selected.

Individuals and organizations can negotiate uncertainties, seize opportunities, and promote resilience in a fast-changing environment by engaging in foresight activities. By doing so, they can better grasp probable future trajectories.

Popper (2008) defines 33 foresight methods which are divided into three groups: qualitative, quantitative and semi-quantitative.

In order to investigate potential future situations and trends, qualitative foresight approaches collect and analyse expert opinions, subjective data, and insights. These methods are particularly useful when dealing with complex, uncertain, and qualitative aspects of the future: Backcasting, Brainstorming, Citizens Panels, Conferences/Workshops, Essays/Scenario Writing, Expert Panels, Genius Forecasting, Interviews, Literature Review, Morphological Analysis, Relevance

Trees / Logic Charts, Role Play/Acting, Scanning, Scenarios, Science Fictioning, Simulation Gaming, Surveys, Swot, Wild Cards & Weak Signals.

Quantitative foresight methods involve the use of numerical data, statistical analysis, modelling, and simulations to quantify future trends, patterns, and probabilities. These methods are particularly valuable when dealing with measurable and quantifiable aspects of the future. Many quantitative methods are used in foresight, for providing an evidence base for futures thinking, or supplying forecasting tools themselves like Benchmarking, Bibliometrics, Indicators / Time Series Analysis, Modelling, Patent Analysis, Trend Extrapolation / Impact Analysis.

Semi-quantitative foresight methods combine qualitative and quantitative elements, incorporating both subjective insights and objective data analysis. These methods bridge the gap between purely qualitative and quantitative approaches and provide a more comprehensive understanding of the future. The following 8 semi-quantitative methods apply mathematical principles to manipulate data derived from subjectivity, rational judgements, probabilities, values and viewpoints of experts, commentators or similar sources: Cross-impact / Structural Analysis, Delphi, Key/Critical technologies, Multi-criteria analysis, Polling/Voting, Quantitative scenarios/SMIC, Roadmapping, Stakeholder Analysis / MACTOR.

At the end, let us list key connections between foresight methods and sustainability:

- *Anticipating and managing future risks:* Foresight methods help identify emerging trends, challenges, and risks that may impact sustainability. By analysing data, conducting scenario planning, and engaging stakeholders, foresight methods enable decision-makers to anticipate and proactively address environmental, social, and economic risks.
- *Strategic planning for sustainable futures:* Foresight methods support strategic planning processes aimed at achieving long-term sustainability goals. They facilitate the exploration of alternative futures and help organizations and policymakers develop strategies and policies that align with sustainability objectives.
- *Informing Policy Development:* The development of sustainable policies and regulations is aided by the projections and insights provided by foresight methodologies. Policymakers can make well-informed choices that support sustainable practises and address societal concerns by taking into account various situations and potential effects.
- *Encouraging innovation and adaptation:* Methods of foresight encourage innovation by spotting new possibilities and technology that can advance sustainability. They urge businesses to modify their procedures, goods, and services to accommodate changing societal and environmental demands.
- *Engaging stakeholders and collaboration:* A variety of stakeholders, including specialists, communities, businesses, and policymakers, are involved in foresight methods. This cooperative strategy encourages discussion, information sharing, and group action towards sustainability, resulting in more inclusive and practical solutions.
- *Education and capacity building:* The employment of foresight techniques in educational contexts can encourage sustainability literacy and equip students to serve as proactive changemakers. Students can learn the critical thinking, future-focused perspectives, and problem-solving abilities essential to handle sustainability concerns by incorporating foresight concepts into courses.

Foresight Methods in Education

Higher education must use foresight methods to anticipate and get ready for emerging trends, problems, and opportunities. These ideas and tactics give educational institutions the ability to actively navigate the quickly changing higher education landscape. Here are some key points to consider when discussing foresight methods in higher education:

- *Anticipating future needs:* Higher education institutions can spot new trends and foresee the demands of the market, the government, and society at large by using foresight techniques. Institutions can modify their programmes and curricula to meet changing demands by studying demographic changes, technological improvements, and socioeconomic changes.
- *Strategic planning:* A well-structured framework for strategic planning in higher education is offered by foresight methods. Scenario planning, trend analysis, and environmental scanning are tools that instituti-

ons can use to create long-term plans that take advantage of new opportunities and solve future problems. This aids in establishing specific objectives, efficient resource allocation, and success positioning for the institution.

- *Innovation and curriculum development:* Foresight methods enable creative thinking and curriculum development that is in line with future demands. Institutions can create curricula that prepare students for the occupations and problems of tomorrow by recognizing emerging fields, interdisciplinary areas, and developing skill sets. Emerging technologies, sustainability techniques, and ethical issues can all be incorporated into the curriculum.
- *Participant involvement:* The significance of including stakeholders in the decision-making process is emphasized by foresight methods. In order to do this, debates and scenario-building exercises must actively involve teachers, students, industry partners, legislators, and other pertinent stakeholders. Institutions can make wise judgements and guarantee the relevance and responsiveness of their programmes by considering a range of viewpoints.
- *Lifelong learning and adaptability:* The importance of lifelong learning and adaptation in higher education is also highlighted by foresight approaches. It is essential for educational institutions to provide students with the knowledge and attitude needed to navigate an uncertain future as the rate of change quickens. Using foresight methods, it is possible to include chances for continuous learning in educational programmes by detecting developing abilities and competencies.
- *Collaboration and partnerships:* Collaboration between higher education institutions, businesses, research organizations, and other stakeholders are encouraged by foresight methods. Institutions can use collective intellect, share resources, and co-create innovative solutions to tackle complicated problems by working together.

Conclusions

Foresight methods offer a methodical and organized approach to comprehending and influencing the future, which makes them crucial in advancing sustainable development. Individuals, organizations, and societies may handle uncertainty, foresee dangers, and work towards a more sustainable and resilient future by putting these techniques to use.

Higher education institutions are given the tools to be proactive, forward-thinking, and receptive to the shifting demands of students, society, and the labour market. By using these strategies, educational institutions can establish themselves as significant forces for social advancement and foster an innovative and adaptable culture within their academic communities.

Foresight techniques can be used at higher education institutions in three different ways. To begin with, scenario planning can be used to imagine many future scenarios and evaluate their effects on sustainability-related concerns including climate change, resource management, and social fairness. Second, the Delphi method can be used to involve various stakeholders, including students, faculty, and outside experts, in gathering insights and opinions on sustainable development priorities and strategies. The Delphi method is a research technique that aims to obtain consensus or expert opinions on a particular topic through a series of structured surveys or questionnaires. In order to keep informed and proactive in their sustainability efforts, institutions can use environmental scanning to monitor and analyse new trends, technologies, and best practises.

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