

Changing the Game

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Prologue

Knut and I have been colleagues (and friends) since the middle of the 1980s. Knut worked in the Department of Electronic Information Processing and I was in the Department for Marketing at The Norwegian School of Economics and Business Administration. After we had presented each our respective doctoral thesis, we entered a very interesting and stimulating period of cooperation of long duration. By asking critical questions to our respective fields of science, we soon found out that we, at a deeper level, were meeting the same challenge. It is not possible to understand the world we live in based on a single specialized scientific perspective; we had to allow interdisciplinary dialogues. We also shared the experience that values could not be separated from knowledge when we are facing challenges in the real world. Values are inherent parts of the world we live in. In other words, we were moving towards holistic science. Over the last 30 years Knut and I have collaborated on teaching and research based on interdisciplinarity and ethics. This collaboration has stimulated our creativity, resulting both in interesting teaching projects and numerous scientific publications. In this article I will reflect upon some of the problems connected to specialization, interdisciplinarity and holism.

Introduction

On the one hand, the challenges facing humanity today seem unprecedented, as we look forward to the future of global environmental change, economic and political globalization, urbanization, and population growth. On the other hand, confidence in scientific research and achieving technological breakthroughs has increased over the last decades, and politicians seem to believe that all problems can be solved without fundamental changes in economic policy and personal lifestyles. This attitude is partly evident in the growing demand for funding of research projects in areas in which the negative symptoms are sufficiently serious. So far the strategy has been to solve the different problems one by one, without paying much attention to how they affect one another. Hence scientific and technological optimists may provide an obstacle for making the necessary changes in order to meet the interconnected global challenges we will be confronted with in the near future.

In the report from the Norwegian public commission “Dannelsesutvalget” (2009), discussing the most pressing challenges in higher education and research, the authors criticize the tendency to put too much emphasis on educating specialists with low competence in dealing with complex interdisciplinary issues. Universities give priority to study programs and research projects based on distinct paradigms in which border-crossing perspectives are given little scope. This results in students receiving inadequate training about how to consider reality from different paradigmatic perspectives and to see the connections between different subjects and disciplines. In the commission’s final report they point out that an increasing number of social, environmental and economic challenges are perceived as complex and global in character, and that “the sum of the discipline-based expertise and sharp-focused or localized measures seem inadequate to deal with them” (Strand 2009: 39). The inadequacy is due to the absence of interdisciplinary knowledge and understanding and cross-disciplinary collaboration. To educate students with ability to creative problem-solving and co-responsible solutions, it is necessary to develop study programs characterized by multi-disciplinarity and increased focus on ethics and value reflection.

Firstly, I will describe and discuss why specialist knowledge is

insufficient to solve the most pressing problems connected to the goal of sustainable interplay between environment, society and economy. Secondly, I will discuss some teaching implications of interdisciplinary science. The question is how higher education and research can contribute to find integrated solutions to complex challenges in real world situations. I suggest that there has to be a change both in the curricula and the teaching methods in order to reach these ambitious goals. In interdisciplinary study programs the students must practice seeing their own discipline in relation to different scientific traditions and values and from other cultural viewpoints.

Specialization and interdisciplinarity

Scientific development over the last decades can be characterized by growing specialization within defined paradigmatic fields of research. The consequence is that specialized knowledge dominates over general insights into wholes and dynamic networks. A lot of uncomfortable issues related to e.g. sustainable development, solving the poverty crisis and how to handle complex social challenges tend to fall into a scientific no-man's land. Researchers in science and economics push value based issues across to the humanities, who are not particularly interested in nature and economy. This moves some of the important issues of our time out of the research focus.

My contention is that specialized knowledge of increasingly smaller parts of reality is only to a limited extent suitable for capturing the inherent interconnectedness of complex issues in real-world situations. We have often experienced that isolated and separate solutions to different problems can lead to amplified negative consequences in other fields of nature, society or economy. When the symptoms of e.g. the financial crisis are curbed through measures stimulating growth in production and consumption, the result may be that the climate crisis intensifies. The reason is that there is a link between economic growth (throughput of energy and materials) and emissions of greenhouse gases.

The advantage of specialized knowledge is that we get more in-depth insight into the distinct phenomena of particular interest; the drawback is that we lose the dynamic wholes from sight. The English philosopher Alfred North Whitehead (1864-1947) warned

against “the fallacy of misplaced concreteness” which he asserted was a consequence of the increasing specialization within science. Specialization led to a situation where knowledge became more and more abstract and thus detached from its natural context. The more successfully a discipline fulfills the paradigmatic criteria established for it, the higher the level of abstraction. “Inevitably, many practitioners of successful disciplines, socialized to think in these abstractions, apply their conclusions to the real world without recognizing the degree of abstraction involved” (Daly and Cobb Jr. 1994: 25). The problem is spreading and is reinforced because the researchers not only confuse abstractions with reality; they also have a tendency to generalize the abstracted theories to include topics beyond the areas to which the knowledge was originally intended to apply.

The problems arising when more and more sectors of society are commercialized through the introduction of economic concepts, theories and models are striking examples of “the fallacy of misplaced concreteness”. Daly and Cobb Jr. (1984) stressed that economic theories are increasingly being used to explain phenomena for which they are neither relevant nor valid.

Part of the explanation for the increasing domination of economy in society is economics’ academic status due to the development of advanced knowledge rooted in a high degree of abstraction. Although the explanatory power and the ability of prediction are not always successful, economic concepts, models and methods of solution have penetrated into new areas of social life, e.g. health care and higher education. The result is that the values related to meaning, interaction and joint responsibility for individuals, society and nature are suppressed in favor of privatization, efficiency, outsourcing, cost reduction and the demand for increased profits. The problem is that knowledge which does not include values, relationships and dynamic processes is unlikely to contribute to a better understanding of the living reality we are a part of.

The Norwegian economist Leif Holbæk-Hanssen (2009) used the term “word-masked-thinking” to illustrate the same tendency. He argued that many of the ideas forming the basis of our actions are anchored in inherited patterns of thought that we use more or less unconsciously, often without even considering their validity or relevance at all. The

consequences could be that our thinking and actions are controlled by empty concepts. According to Holbæk-Hanssen, the increased use of concepts such as market forces, price mechanisms and competitive power to explain and predict economic development are examples of how “word-masked-thinking” is dominating current economic theory and practice. To get out of this impasse he believed it was necessary to change our basic perception of reality, our ways to seek knowledge and our way of acting. In short, we needed a “great spiritual cleaning” where revitalization of the education systems is of special importance. Capra has argued that “we urgently need a science that honors and respects the unity of all life, that recognizes the fundamental interdependence of all natural phenomena, and reconnects us with the living earth” (Capra 2007: 12).

Collaboration across disciplines gives scientists the opportunity to see their own topics from new and multi-faceted perspectives. In addition interdisciplinary work stimulates creativity. In interdisciplinary work new concepts, theories and modes of understanding are required. In order to succeed it is necessary to develop a language that makes it possible to communicate meaningfully between different academic traditions. According to Bhaskar this will necessitate epistemological transdisciplinarity, involving the exploitation of pre-existing cognitive resources drawn from a wide variety of cognitive fields of science. “Such transdisciplinarity in creative interdisciplinary work has seemed to some writers to involve breaking with the very notion of a discipline, to the extent that there has been talk of postdisciplinarity” (Bhaskar 2010: 5).

The renaissance painter and scientist Leonardo da Vinci (1452-1519) offers an illustrative example of a researcher who practiced a multidisciplinary perspective. He was always looking for evidence linking different disciplines. Patterns and relationships that apply within a subject gave him the inspiration to find new solutions in other disciplines. According to Capra “the exceptional ability to interconnect observations and ideas from different disciplines lies at the very heart of Leonardo’s approach to learning and research (Capra 2007: 5). Another important characteristic of Leonardo’s holistic academic work, that is highly relevant today, is his openness with regard to revising theories and models in one subject based on new observations or insights into other relevant disciplines. “Leonardo’s method

of repeatedly reassessing his theoretical ideas in various areas meant that he never saw any of his explanations as final” (Capra 2007: 164).

Today we can illustrate the richness of interdisciplinary work by pointing to a new tendency in economics in which philosophical and psychological knowledge provide insights leading to changes in economic theory and practice. One striking consequence is that a change in the concept of man within economics, from the self-centered, utility-maximizing “economic man” to the integrated and co-responsible “ecological man” will have dramatic consequences for both theory and practice in this field of science (Ingebrigtsen and Jakobsen 2009). The inspiration for a change in the concept of man comes from many sources, amongst others Alfred North Whitehead’s philosophy of organism, Abraham Maslow’s humanistic psychology, James Lovelock’s Gaia theory and Arne Naess’ eco-philosophy.

Interdisciplinarity in higher education

Increasing fragmentation of faculties, institutes, departments and centers at universities bears clear evidence of a trend in which overall considerations and multidisciplinary issues are in danger of being given lower priority or even completely forgotten. This organization of knowledge has been brilliantly productive but according to Herman Daly and John B. Cobb Jr. “it also has built-in limitations and dangers” (Daly and Cobb 1994; 25). The students are educated to be obedient paradigm carriers.

Specialization is important for promoting efficiency in specific areas, while the assessments and actions that promote accountability for nature and society in the long term are based on broadly based general knowledge. In recent years, specialized instrumental models have taken over much space in the fields of humanities such as philosophy, aesthetics and ethics. The requirements for increased efficiency and economizing in society have led to a situation where the humanities are seen as a luxury we cannot integrate in the curriculums in natural and social sciences, including economics. In my opinion critical reflection on fundamental interdisciplinary and ethical issues is not a luxury; it is a necessity in order to develop comprehensive and realistic knowledge.

Today, we experience a growing tendency that knowledge is converted

into commodities offered in the market. Science is reduced to an economic production process in which knowledge is defined as the scientific output. This means that the value of knowledge is connected to the price customers are willing to pay. The inherent value of knowledge is reduced to something exclusively for principal speeches. To recover knowledge as our most dominant existing cultural good it is therefore important that teachers, researchers and students help transcend the commodification of scientific work.

Teaching at universities has largely been about teaching students, concepts, theories and models that they can expect to encounter in their written exams. This means that issues that recur at the examination affect the learning process as much as the educational and professional visions we find in the ideal wording in the curricula. The consequence is that students are trained in atomized and detailed knowledge within limited and distinct topics. The skills of the student are quantified in the form of the diploma they receive after passing the exam.

Every student is more than a future employee; every individual's personality is far more complex than his or her scores on standardized IQ-tests. Interdisciplinary education should be understood as the art of cultivating the moral, emotional, physical, psychological and spiritual dimensions of the developing students. The goal is to stimulate thinking that seeks to encompass and integrate multiple layers of meaning and experience rather than defining human possibilities narrowly. In order to succeed it is necessary to develop education programs based on socializing the interdisciplinary research worker, "very different from that involved in orthodox monodisciplinarity" (Bhaskar 2010: 5). Education should include more than interdisciplinary dialogues; an equally important element is the understanding of the relationships and the ability to apply knowledge in a wise, value- reflected manner. By working with philosophical, aesthetic and ethical issues, students develop the ability to ask questions opening up new horizons and making the values visible in everything that surrounds them. The goal is that education should contribute to students' opportunity to realize their innate potential to the full. In order for this to happen, the teaching must help arouse curiosity, imagination and creativity. All the aforementioned characteristics are important for the students to be equipped with in order to meet future challenges in a balanced and

responsible way. The need for creativity and border-crossing research projects are of special importance if we are to succeed in solving the most urgent global challenges we face today and in the future.

In accordance with the mechanistic models, inspired by Enlightenment philosophers and scientists, such as Descartes, Locke and Newton, the learning process at many modern universities may still be compared to filling water in a bucket. The teachers fill up the students with knowledge, with the process requiring a minimum of participation from the student. The success of the learning process primarily depends on the skills of the teacher.

A more relevant understanding of learning is based on an organic approach, in which knowledge can be considered “food” in an ongoing co-evolutionary process. To be able to benefit from teaching, new information must be processed continuously by the individual. If information remains undigested, the result is at best fragmented knowledge. The point is that education is something we achieve through ongoing reflection about our own framework of understanding and basic cultural values.

In addition, the learning process takes place through continuous interaction with the environment, society and nature. The lack of integration between the various elements leads to knowledge that is remote and abstract. It is therefore necessary that teaching methods are based upon active participation from the students. The learning process should be vibrant, interesting and challenging for students. The art of holistic education lies in its responsiveness to the diverse learning styles and needs of evolving human beings. Teachers should be trained in the Socratic spirit to be “midwives” helping the students discover knowledge rather than being a lecturer who presents the finished chewed through facts that will later be reproduced in the exam. Holistic education is based on the premise that each person finds identity, meaning, and purpose in life through connections to the community, to the natural world, and to spiritual values such as compassion and peace. Holistic education nurtures a sense of wonder.

Conclusions

It is important that both students and teachers are aware that learning is a process that develops in the interaction between the interpretation

of experience from the past and visions of the future. Without such an approach learning is in danger of becoming passive and even perhaps an undigested receipt of information, rather than being a process that empowers responsible, socially conscious people. The goal of higher education is to help students to understand and find meaning in different phenomena with reference to a larger context. All phenomena are ultimately interconnected and their essential properties are derived from their relationship to other things. In this perspective, the exam could be turned into a venue for students to ask questions directed at real world situations or a text with an aim to encourage critical reflections about values and creative problem understanding and solving. This fits in with Pasteur's understanding of scientific development, "science advances through tentative answers to a series of more and more subtle questions which reach deeper and deeper into the essence of natural phenomena" (Capra 2007, p. 159). Holistic education aims to call forth from people an intrinsic reverence for life and a passionate love of learning. This is done, not through an academic curriculum that condenses the world into instructional packages, but through direct engagement with the environment. Help the person feel part of the wholeness of the universe, and learning will naturally be enchanted and inviting. There is no one best way to accomplish this goal, there are many paths of learning and the holistic educator values them all. What is appropriate for some children and adults, in some situations, in some historical and social contexts, may not offer the best approach for other people.

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