

Food for thought: What education could learn from agriculture

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Abstract

Knowledge is like food and drink, a bare necessity of life, the motor of the economy, and a precondition for any social activities. While considering these facts one cannot fail to notice that education and agriculture have a lot in common. This article reflects on the parallels between agriculture and education. While agriculture started modernizing its methods and tools two centuries ago, education is just in its early phase. The article analyses the rise and fall of agriculture and distils patterns that may be of significance for education.

Introduction

Today's education is a bit like agriculture in days gone by. Fresh supply of food for thought is necessary to keep fit and up-to-date. Nevertheless, supply does not meet the demand. The latter is becoming increasingly refined and more extensive. Knowledge is in high demand, but education cannot keep up with

the high pace of changes in the knowledge economy. What does agriculture teach us? Which lessons can we learn from butter mountains, surplus grain, withdrawn cucumbers and tomatoes, road blocks, farming politics and the still-existing famine?

Agriculture

Until the end of the 18th century, agriculture used to be a small-scale activity. Products were grown in a traditional way, according to the unaltered, medieval principle of crop rotation every three years. With the arrival of the mechanical sowing machine in 1782, a new era of expansion, rationalization and an increasing usage of new methods and technologies started. Modernization progressed steadily. Productivity rocketed due to the cast iron plough, the reaper, and the threshing-machine which now took over those activities that had been done manually since human memory. Less expensive means of transport like railways and waterways diminished distances: it was now possible to cultivate agricultural products far from urban regions. Since then, there have been technological innovations such as new methods of drainage and irrigation, artificial fertilizer, pesticides, selective breeding, and genetic manipulation. Today's farmer is more of a technocrat who runs his business from behind the computer, and he is less active inspecting his crops outside.

Education

The position of the farmer in agriculture can be compared to the position of the teacher in education. Teachers do try to create the perfect conditions for new talent to grow and to flourish. Didactic ways of cultivation find their roots in the medieval model; in this, the master craftsman took care of a few novices by providing extensive support. School epitomizes the institutionalisation of education and it is the educational equivalent of the greenhouse that protects the vulnerable seedlings against hail, wind, cold, and other influences that can interfere with normal growth.

The invention of blackboard and chalk did stimulate class teaching, because of which "productivity" improved. However, new educational technologies took a long time to develop, except for the dip pen which created the conditions for a correct writing position and the tidiness of the script. After a hesitant start of using the audio-cassette recorder, school television and the video, a period of fundamental

changes has finally come for education with the arrival of computers, world-wide networks, broadband and mobile technology. E-learning environments enable easy access to knowledge resources and they bridge physical distances. Just like farmers, teachers experience a drop in the number of teaching hours and they will have to sit behind the computer more often to watch over the process. The assignment given to education is not just a matter of content. Education also has to change their modes of presentation and delivery, because customers develop have greater expectations and demands, expecting made-to-measure and personalised educational services. In the domain of lifelong learning customers combine their study with an active career, and expect sufficient of freedom for choosing their own study pace, time and place. These new target groups are highly heterogeneous with respect to prior knowledge, experience, ambitions and possibilities, and they require made-to-measure learning activities that can be largely directed by themselves. What is expected from education is not monoculture, but custom-made training, diversification and flexibility in order to satisfy the varied need for knowledge.

Expansion

Modernization of agriculture was started off by new devices which yielded scale profits. Large machines were of no use on small, badly accessible plots of land. Land consolidations were used to straighten the landscape and to enlarge and uniform the farmlands. The all-round farm labourer gave way to the specialized and well-trained agricultural contractor for example the crane driver, the potato harvester, and the drainage technician. Whereas in agriculture, the agricultural revolution began due to mechanization, in education for that matter, e-learning will be making the difference. By now, many schools and educational institutes are using web portals and e-learning facilities. However, this has not yet effected increased productivity. Nevertheless, it is a first step towards connecting to the world-wide networks and thus connecting people and resources. Through these networks new ways of teaching and learning will develop, and students can literally choose their own menus since time and place will not be that relevant anymore.

Since teaching methods and tools will become more and more versatile and complex, it is nearly unthinkable that the job of all-round specialist (*subject teacher*) will stay as it is. It will be likely that education requires a variety of different teaching roles, each of which having the status of a skilled,

specialized profession (e.g. assessment, coaching, moderation, evaluation, quality assurance). Even if some of the tasks of the good old school teacher are to remain, the larger part of the teacher's autonomy will be lost as a result of interdependency, variety and complexity of systems, and on top of that the strict quality conditions of the whole process, which have to be taken into account. The educational equivalent of better cultivation methods, fertilization cocktails and plant improvements does evoke futuristic images. Pupils can look forward to "a special treatment" which will help them to mature as quickly as possible. It is all about sophisticated, developed learning strategies, from which they, after careful selection and perhaps even genetic modification, could be chosen to be isolated like greenhouse plants. Thus, protected against interfering influences, the pupils could obtain dedicated nutrition supplements that enhance performance.

Conservatism

The teacher is the farmer of education. Farmers as well as teachers have got a built-in conservatism, which results from the never-changing cycles of sowing and harvesting, life and death, summer and winter as have been taking place year after year. Just like farming, teaching is more than a profession, it is a vocation, a passion, a way of life, a mixture of art and skill aimed at personal care and attention for maturing individuals. New technologies which might harm this vision can, of course, expect scepticism. The attitude of the devoted, humanist teacher does neither agree with the industrial vision of policymakers, managers and politicians, nor with expansion and businesses predominated by output and cost and in which pupils have changed into numbers. Of course, the teachers are fighting for a good cause because those who study are not plants.

It is common knowledge, that behind the gigantic facades of the schools that once merged, a small-scaled craftsmanship remains hidden in which caring teachers take pity on their plots as crofters. However, it is doubtful whether it can stay this way as in the beginning, the farmers did not like to trade in their shire horse for a tractor.

Protectionism

Since the olden days, agriculture has been of strategic importance for any nation. Too high a dependency on foreign food suppliers was of no good to the national sovereignty; a good level of being self-sufficient

could determine winning or losing a war. Mechanization and expansion supplied these certainties through a larger and more stable production. However, by the end of the 19th century cheap products from the new agricultural regions (Australia and Argentina) flooded the home markets. In return, a policy of protectionism arose e.g. import duties, quota and guaranteed prices. The European agricultural policy sets a good example for this. Through an extensive subsidy system this policy provides food for the consumer at reasonable prices. Education is going the same way. The European Treaty of Lisbon confirms the strategic meaning of education: good education is necessary in order to make Europe into the most competing and dynamic knowledge economy of the world. The main objective is not only meant as prevention of the need of knowledge but also to increase sufficient lead over other countries. Education can, undoubtedly, look forward to extra subsidies and investments during the next coming years. As in agriculture, the threat will come from the outside e.g., from the low-wage countries, from countries with a leading position technologically, or even from our immediate neighbours. Foreign educational institutions will offer superior and cheap online services which will oust local education from its current position: everyone can enter New Delhi, Dubai or Shanghai because distance is of no meaning whatsoever. The home institutions will disappear or will be into franchising at the very most, without having the possibility to change anything in their shop pattern. In case of a shortage of a knowledge-expertised workforce, off-shore (contracting out knowledge-based tasks abroad) and consultancy (e.g. flying in experts from abroad) will increase our dependence. Oppositely, in case the knowledge economy develops less dynamically than hoped for, our knowledge workers would emigrate rather than sitting at home jobless (brain drain). The impact of all of this is enormous. The speed of the internet cannot be compared with the speed of the ocean steamers, which in their days shipped in cheap grain. Protectionism seems inevitable. That is: disproportionate subsidising of the home-based educational infrastructure, import duties on foreign institutions which offer education, quota on foreign expertise, more confidentiality, registration and licensing of knowledge, export duties on knowledge and high transfer fees as in sports, but now on knowledge emigrants. Education will get a strong local profile, and despite the Bologna declaration and others, a mutual recognition of certificates will be out of the question.

Liberalization

However, maybe it will not come to that, because the protectionism of agriculture is under a lot of pressure. Let's take Europe as an example. Agricultural policy does not only absorb large amounts of tax revenues (half of the total EU-budget, being 43 billion euros annually), it also enlarges the gap between the rich and the poor. On the one hand farmers from developing countries cannot sell their products in "FORT EUROPE", and on the other hand they are being confronted with the fact that European surpluses are dumped on the world market. Paradoxically, our grain surpluses, butter mountains and milk lakes do not offer a structural solution to the famine and poverty in the world, because they deprive local farmers of the possibilities to build up a reasonable living. The GATT, the WTO and the forces from inside the EU are battling in favour of drastic restructuring and liberalization of agriculture. Despite all the protests from the farmers, reconstructions in agriculture are inevitable, as well as lifting the trade embargoes. With this know-how, it might be possible for education to skip the phase of protectionism, and advance directly towards an open-knowledge-based economy. The signs seem to be in favour with a world-wide trend towards open-source software, open standards, open content, open-educational resources and open access. The open-source movement is not only an ideology to mesh well with the anarchy of the internet, it can also be a significant, political factor in preventing of what went wrong in agriculture. In that case, there is no need for anybody to fear for road blocks and other immobilizing protests by angry teachers.

Regression

The agricultural industry has been able to produce a constant supply of foods for a low price. Nevertheless, there are undesirable side effects. In all their abundance, many foods are tasteless and poisonous, and they have lost their natural cycle (tomatoes in winter). To consumers, food has become something obvious, something that is always there; however, the composition, the origin and the cultivation are unknown to them. Fast food is easy for us as consumers, but not in all respects. The consumer is inclined to regression. Increasingly consumers want food that is grown organically, and they are prepared to pay a bit more for products that were grown on a small scale, locally. In education, a similar counter reaction is possible, certainly today, as teacher and student are growing apart and

anonymity is enlarged. The image of distributed e-learning, whereby students draw their bit of fast-food education out of the wall, lacks the personal care which a teacher could offer by direct contact. In the case of demand-driven education, there is the risk of underestimation, carelessness and drop-out. In the absence of a teacher, who will be guarding the tidiness and the effort, if calligraphy is being replaced by the easy "cut & paste" option. The need for personal attention and security amidst an abundance of educational opportunities, offers new challenges to the "teacher", who as a role model and a coach would supervise a certain group of learners. That way, it may even be possible for the teachers to start their educational clog dance. Regression is also being reflected by the demand for vocational education, authentic tasks, and the integration of school and work. It is a signal for not creating a self-governing body of education, which could easily outpace itself socially and contextually. Seen from that perspective, the fact that learning, working and technology would become closely interwoven could imply the end of the school, as once claimed by Louis Perilman. By then, learning will not be tied to institutional boundaries anymore and it becomes a natural activity, a way of life. An analogy with agriculture can be found: after an episode of rationalisation and economies of scale, small-scale activities will return more and more, streams that were once canalized will be allowed to meander again, and agricultural lands (once fought for) will be flooded or returned to nature in a different way. A historical correction that will close the circle: the rise and fall of the agricultural nation.

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