

HUMANIST EDUCATION AS A TOOL OF EMPOWERMENT

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Abstract

This article argues that the current global economic downturn also represents a crisis in discipline-oriented academic thinking, especially in the areas of ethics and economics. These two disciplines are still largely based on rationalist and idealist views of the human being and therefore incompatible with the real nature of the human being as revealed by recent research findings in anthropology, neuroscience and experimental psychology. As a result, policy makers as well as educators are likely to increase their interest in humanist education, which regards individuals as social beings that must learn to live in two worlds with different rules; the world of the community that is ruled by the informal rules of fairness and reciprocity and the world of society at large in which people tend to pursue their self-interest. National education systems must prepare future generations to serve the needs of their communities as well as to thrive within the complex rules of the market economy and democracy. In this context, it is important to recognize that community identity can only survive by embracing cosmopolitan values that ensure connectivity and exchange with the larger social environment. This will be illustrated by discussing the education system of Florence in Renaissance Italy and comparing it with education initiatives in today's successful emerging economies. The rediscovery of humanist education may also lead to national economic and cultural empowerment through endogenous growth in Africa.

Keywords: Interdisciplinarity, food crisis, economic theory, Humanism, South-South collaboration, Renaissance Italy

1. Introduction

1.1 *The crisis and what it reveals about the academic system*

The food crisis and the subsequent financial crisis of 2008 reveal an intellectual crisis in academia that has grown steadily since the end of the Cold War. Institutions that were originally designed to serve the people have changed into large self-contained systems of thought that have developed their own internal logic and thus become increasingly concerned with their own survival and expansion.

Simone Weil called this phenomenon 'the great beast' that is intrinsic to every form of evolving social organization [1] and Joseph Schumpeter recognized it as the great curse for entrepreneurial capitalism [2]. However, once these self-contained systems become part of the problem rather than part of the solution to contemporary challenges, new opportunities for intellectual renewal may emerge. That said, policy strategies pursued before and after the crisis year of 2008 still reflect ideas that have their roots in the 1970s, ignoring the reality of the global knowledge economy and new insights from recent empirical interdisciplinary research.

It is therefore not surprising that the bureaucracies in business, government, academia and civil society are mostly in denial about their particular responsibility for the crisis and are engaged in ex-post rationalizations of their policies and recommendations prior to the global crisis.

1.2 *The case of the food crisis*

When world market prices for major food and feed stocks rose to previously unheard of levels in spring 2008, the situation caused violent protests among the poor in many large cities of the developing world. Their tight household budgets were no longer sufficient to cover the basic expenses for food. This development took policy makers across the globe by surprise because it was widely assumed that the trend of declining food prices over the past decades would continue due to technological progress and the fact that, in economic terms, basic food is characterized by low income elasticity (the share of food expenses in household budgets normally decreases with increasing income).

When it came to staving off the food crisis, governments largely used conventional policy recipes based on neoclassical welfare economics. They imposed export restrictions and approved the expansion of cultivated land to ensure the national public good of food security – mostly at the expense of food importing countries, which had to deal with even higher food prices on the world market. The same lack of originality can be observed in a recently published influential report called *International Assessment of Agricultural Science and Technology for Development*

(IAASTD) [3], which supports the large NGOs and academics in affluent society who advocate a return to traditional agricultural methods and food sovereignty. Like many traditional welfare economists they seem unable to spot any potential new technologies that might be useful in addressing the basic problems of food crises.

Many of them were trained back in the 1970s on comparative-static neoclassical economic theory [4] and dualist theories of underdevelopment (e.g. dependence theory, structuralist theories) [5] that are unable to explain the complex, messy and dynamic reality of today's knowledge economy; yet they continue to shape university curricula and public policies [6].

By claiming that the food crisis is a result of unfair distribution rather than low local food production capacity, many of these conventional 'experts' indirectly endorse a sort of food aid that is akin to food dumping (food surpluses in industrialized countries are to be freely distributed in developing countries) and ignore the importance of combining existing local knowledge with selected and tailored new technologies in addressing not only agricultural but also environmental problems. By insisting on approaches that may be in line with old theories but which have proved to be ineffective and impractical in the real world, their claims reveal a lack of moral sensitivity towards the often voiceless poor who are affected by their false advocacy and a preference for the cherished world views and prejudices of their own affluent constituencies. Taking into account recent insights in neuroscience and evolutionary psychology [7], one might argue that our brains have evolved a strong capacity not to empathize with those in such different circumstances. Yet, in a globalized world, sustainable survival strategies increasingly require us to empathize and socialize with people who do not share the same culture and belief systems.

The reality on the ground, particularly in Africa, has worsened considerably over the past decade. Sub-Saharan Africa has become more dependent on food aid than ever before [8]. One reason for this misery might be the continent's strong ties to its former colonial masters in Europe and the high economic dependence on aid and European market access for agricultural goods. This has made African governments more prone to adopt policy prescriptions from Europe that were based on outdated but imperial knowledge that lacked a proper understanding of the local context [9].

The food crisis of 2008 should nevertheless undermine such neocolonial development strategies, especially considering that, for more than a decade, South-South collaboration within the developing world is growing much faster than North-South collaboration [10]. South-South

collaboration is less concerned with standards and regulations to preserve cultural identity and more on facilitating sustainable change through investment in cultural, economic and technological exchange. Its primary purpose is to jointly address economic and social problems, by investing in local people and jump-starting joint research and development programmes designed to promote home-grown technological development with significant spillover effects for the local economies [11].

It may be that South-South collaboration is not addressing the problems that are high on the priority list of Europeans and Americans – and still depends on many valuable North-South links, but South-South networks are often far more pragmatic in their approach and thus more effective in meeting the goals they intend to achieve. Furthermore they do not have to worry about pleasing the people back home as is the case with many donor agencies, NGOs and supermarket chains based in Western countries and they are generally less ideological. They simply cannot afford to waste money by organizing countless local workshops in the name of 'capacity building' (a term that frequently serves to impose foreign views on local people) and then call it 'empowerment' or 'help for self help'. With the global economic downturn and the urgent need to effectively address the global environmental challenges, the justification for such expenses may also have to be revisited by European donors. There is a need to focus more on the priorities of the poor and to take more seriously what they consider to be major problems and how these ought to be addressed. This is of course a challenge, not least because the aid-dispensers often feel that they know best due to the academic education they have received in their home country. Frequently, and mistakenly, they also attribute the deferential treatment they receive in host countries in Africa to their 'superior' education rather than to the fact that their visit might bring money. Not surprisingly, aid-recipients are often willing to agree with everything proposed as long as aid money is dispensed. Yet, once international donors realize that the best ideas in development practically never come from idealists in Europe or the US but rather from local practitioners in developing countries themselves, they might change their minds. Put simply, the major difference is that while Western idealists see the problems and want to solve them by changing the system, local practitioners see the opportunities within the existing system and want to realize them. The global knowledge economy does indeed offer many opportunities for local people to combine their practical local knowledge with the use of new technologies that are sufficiently affordable and flexible to contribute to tailor-made solutions. In this context, it is not important whether the good or service is produced in the South or the North, or in the private sector

or the public sector, so long as it is useful and applicable. These are lessons that can be learned from the pragmatic approach in South-South research collaborations where stakeholders have learned from experience that the only non-scarce resource, and the only resource that is not depleted with increasing use, is knowledge. Therefore major investment needs to go into the production and use of knowledge that is of practical relevance. This means investing in human capital and the mobilization of science and technology for cost-effective technological innovations that foster economic development and a more sustainable use of natural resources. In this endeavour, we should abandon our cherished antagonisms in which one has to take sides between small-scale and large-scale agriculture, traditional knowledge and new technologies, public sector activities and private sector activities, to name but a few. In the face of the urgent need to address the complex problems related to hunger, malnutrition, environmental degradation and economic development it is pointless to cling to such dualistic worldviews if they do not produce tangible results. Yet, since the dualist mode of thinking still prevails in the teaching of economics and ethics in Western institutes of higher education it is unlikely to disappear any time soon from affluent societies, even though it was part of the reason for the global financial crisis which began in the autumn of 2008.

1.3 The financial crisis and the subsequent economic downturn

It may be a coincidence that the food crisis and the financial crisis occurred in the same year, but both crises are rooted in same flawed comparative-static equilibrium models that ignore the evolutionary character of every economic system [12] as well as the fact that it is unconscious or bodily thinking rather than the rational conscious mind that is responsible for most human decision-making [13]. These “animal” spirits account for the often messy decision-making process of economic agents [14]. They were still taken into account by the great economists in the early 20th century but have since somehow disappeared from the mainstream textbooks on economic theory.

For many decades, general equilibrium (GE) models are applied by agricultural economists working in institutions such as the World Bank and macroeconomists working in central banks. These economists mostly worried about the prices of goods and services while they neglected the prices of assets, trusting the financial markets to assess them properly. Consequently, in such GE models, bankruptcy cannot occur because financial intermediaries such as banks do not appear in the model. Convenience led economists to abide by these models, believing that

what does not appear in the model must be irrelevant [15].

The academic discipline of financial economics, in particular, seemed to espouse almost a religious faith in models that assume purely rational economic agents. Most of these models are based on the efficient-market hypothesis (EMH) developed by Eugene Fama in the 1970s at the University of Chicago. The EMH argued that the price of a financial asset always reflects all available information that is relevant to its value. Wall Street then concluded that markets would automatically price financial assets accurately. Deviations from equilibrium values would be quickly detected by the rational investor who made money by exploiting the deviation by means of the various financial instruments available. The theory was that such rational investors would also quickly detect a bubble and prick it before it grew out of control. In the current climate it is no longer necessary to rebut these assumptions in view of the fact that its flaws have already been revealed through the financial crisis. But we should not lose sight of the fact that most public policy instruments today are still based on the idealist view of a purely rational and cognitive human being.

In short, both the food crisis and the financial crisis revealed that the economic models that rely on a purely rational economic agent may do more harm than good in public policy. The human being is guided by a dynamic belief system that largely reflects life experience as well as internalized knowledge acquired from different sources. The narrow view of the human being as a human *oeconomicus* driven exclusively by material self-interest and stable individual preferences contradicts all insights from experimental psychology [16]. Moreover, the human being is generally not a passive observer but one actively engaged in pattern recognition and storytelling to make sense of this world and find opportunities to make a living [12].

2. Reconsidering the theoretical foundations of Humanism

Humanism is the term generally applied to the predominant intellectual and literary currents of the period from 1400 to 1650 in Europe. It has its roots in Italian Renaissance and the age of exploration that lead to a revival of business, arts and science. In this period prior to Enlightenment, the great scholars did not yet separate inductive research (moving from specific to the general) from deductive research (moving from the general to the specific) and they did not regard ethics as being *per se* opposed to the pursue of self-interest. They embraced instead a

more holistic approach to research and ethics that was not yet characterized by a dualist mindset. This more holistic approach pursued in the age of humanism is being rediscovered today thanks to many new empirical insights on revealed human behavior and decision-making that are in line with humanist philosophy.

2.1 How ethics and economics have lost touch with real human nature

The deductive approach preferred by neoclassical economists starts from the premise that the human being is a rational utility maximizer. This generally accepted principle would allow economists to logically deduce human behavior in real life. This deductive logic does however not permit changes in theory that might undermine its fundamental assumptions. It would threaten the platonic beauty of the comparative static equilibrium models in economics. Even though the predictions of these models turned out to be inaccurate or simply wrong, there were always explanations at hand, at least before the economic downturn, to explain away inconsistencies as a sort of noise [15].

Behavioral economists and political economists, who are generally less attached to neoclassical theory and its equilibrium models, have shown increasing interest in the basic insights obtained from research in experimental psychology and the neurosciences. They have also introduced a more inductive approach by designing controlled laboratory experiments.

Their findings largely confirm what has already been inferred from insights gained in the cognitive sciences: people may pursue their self-interest but they also have other-regarding preferences that often keep them from maximizing their immediate material benefits. Experiments on cohorts of student volunteers from across the globe seem to confirm a universal preference for fairness and reciprocity in different economic games [17]. Yet, rather than using evolutionary economics and attempting to explain these other-regarding preferences as innate human instincts that evolved during the period of hunter-gatherer communities to facilitate effective cooperation in small communities, behavioural economists tend to attribute it to another form of rationality. This rationality is supposedly related to universal ethical principles and notions of justice and fairness rather than economic principles (19). This idealist assumption resembles Kant's view that the real value of a moral act can only be seen in the categorical absence of personal desires and interests. It is also strongly connected to the theory of the stages of moral development developed by Lawrence Kohlberg in the 1970s and defines the highest stage of moral reasoning in accordance with the

purely cognitive and reason-based view of de-ontological ethics [18].

Yet, behind the allegedly objective, unbiased and disinterested reasoning about justice and fairness, there almost always lurks something that has nothing to do with ethics. For example, if we have the power to hurt someone who humiliated us previously at a time when we were powerless, we will probably do it, but call it 'justice' rather than 'vengeance'. If we see a very big and expensive car parked in front of a village restaurant, we might complain about unfair material inequality and call for redistributive measures. But our underlying feeling is probably closer to personal envy than a genuine desire for fairness. We are however afraid of admitting such motives since our consciousness has evolved to deny the influence of base unconscious feelings on our conscious thinking. Moral fear rather than reason is therefore revealed through our moral systems. This fear is however masked by the taboos and hierarchies of society [13].

2.2 Learning to live in two worlds: the laws of cultural evolution

There are natural forces in the human being that are nevertheless conducive to amity and tolerance as opposed to the forces conducive to belligerence and intolerance. Such forces may indeed reflect a moral truth that is consistent with human nature. The notion of moral truth is however more a product of cultural evolution than natural evolution [19]. For example, the ability to argue persuasively that your rival had no valid grounds for grievance would have been favoured by natural selection in the age of hunters and gatherers when outsiders mainly represented rivals who competed for the same resources. Yet, once the human being started to engage in trade and technological innovation and thus jump-started cultural evolution, zero-sum games transformed into non-zero sum games in which it suddenly made sense to engage with former rivals and exchange goods and services for the benefit of both parties. This transformation also required a change in the evaluation of the moral status of the former rival and the ability to look at things from his or her point of view. It would be a first step towards overcoming the dualist mode of thinking and discovering the benefits of collaboration with people who do not belong to the same community. In other words, it was the beginning of a new mode of living where people had to learn to live in two worlds: the world of their own community in which the informal rules are based on fairness and reciprocity, and the world of society at large in which formal rules were designed to make the pursuit of self-interest mutually beneficial [20] [21] [22]. As a consequence, non-zero games with people outside the familiar community be-

came not only beneficial for the individuals, but also enriched their respective communities. However, the costs for communities who do not want to or cannot participate in such exchange also increased continuously and help explain most of the global inequality we face today. Thus, in order to create equality and fairness more exchange and not less is required. This makes it essential that our education system starts to teach students how to learn to live in two worlds that function according to different rules, but need each other to ensure long-term survival. The community we grow up in teaches us norms and values that are based on fairness and reciprocity and gives us a cultural identity and the ability to trust the people in our neighborhood. They ensure that traditions that provide meaning and orientation to members of the community are preserved and passed down to the next generation. In turn, members who undermine the dependable unwritten rules of interaction within the community can be quickly identified and punished. These informal rules of the community, which can be relatively easily enforced and are based on fairness and reciprocity, stand in strong contrast to the formal rules of large markets and democracies, which are based on the assumption that individuals pursue their self-interest once they seek employment and a career outside their community. In this world of society at large, one cannot assume that the informal rules of one's own community still apply. Instead, successful formal rules in business and politics are designed in such a way as to make daily interactions outside the community beneficial for the parties involved, even though they might not share the same values. In other words, successful formal rules tend to produce unintended positive externalities by ensuring peaceful interaction between communities that pursue primarily their self-interest. Once members of a community are successfully integrated into the global economy and learn how to defend their interests in the political arena, they can also take better care of the more vulnerable members of their community and preserve their cultural identity by spending the revenues gained from exchange on community activities. At the same time, they adjust their traditions to a changing world so that they remain attractive and viable for the next generations. In such a social environment the strongly entrenched dualism in communities of 'we versus them' can be overcome because people recognize that exchange is a non-sum zero game that does not threaten their identity but enriches it.

2.3. The expansion of non-zero sum games

The first great expansion of non-zero sum games happened around 1000 BC when the Phoenician cities in the Levant started to establish a network of trading points along the shores of the Mediterranean. Phoenician mer-

chants formed cosmopolitan trading companies where Jews, Greeks and other ethnicities shared one ship for a period of about four months to sell their goods in other parts of the world and bring foreign goods back to their home country. The main objective of the Phoenician merchant may have been to convert his service into a profit by exploiting the price differences between centre and periphery in the new trading space. However, the moral by-product of this undertaking was better access to knowledge, goods and services for people who previously suffered from physical shortages, a lack of opportunities and few possibilities to change their situation. In addition, people from one culture learned about the habits, institutions and languages of people from another culture, and the joint pursuit of a business forced them to respect the other point of view and seek compromise rather than confrontation [22, 23].

The resulting extension of moral imagination from friends to rivals is therefore improving the ability of participants to play games with other parties more successfully and thus realizing the gains from non-zero-sum games. It then suddenly makes sense to see people not primarily as potential enemies but as people one can do business with (21).

2.4. Reforming the social order based on trial and error

Even negative-sum prospects that may result in side-effects of the proliferation of non-zero games such as increasing social inequality, depletion of natural resources, climate change, and environmental degradation give entrepreneurial innovators an incentive to make better use of available knowledge to come up with new technologies, services and policy instruments that help address these challenges through technological and intellectual renewal. Global problems therefore cannot be solved by simply physically destroying the existing social order and replacing it by a new one that, over time, will look increasingly similar to the old one. Instead they must be addressed by reforming it. Past evidence indicates that successful reforms always reflect a process of adjustment to changing circumstances. They are achieved not just by means of regulating unsustainable change but also by facilitating sustainable change through the mobilization of science, technology and innovation for development [22]. Yet, the mobilization of science must not take place at the expense of human empowerment, ethics and religion, as will be illustrated in the following section on Renaissance Florence.

3. The virtues of Renaissance Florence

The message inherent in all the great religions is to find personal salvation by recognizing the human nature that we all share and obey to the necessity of life [1]. This necessity comprises the obligation to fulfil one's own potential in order to become productive in life and to contribute to the flourishing of the society on which our well-being depends [24]. The moment in history when the search for personal salvation and fulfillment coincided most closely with social salvation was during the Renaissance in Italy in general and Florence in particular in the 14th and 15th century. Even though this was an age of political, economic and cultural turbulence, it opened a unique window of opportunity for the underprivileged to improve their livelihoods through the development of unique skills and hard work. The reason why both human creativity and social welfare thrived best in Florence was probably because the privileged classes found it more difficult to maintain their superior social position by means of mere oppression of the lower classes. As Goldthwaite [25] reveals in his book on 'The Economy of Renaissance Florence', this was largely related to the political and economic crises that hit Florence in the 1340s. At that time, the ruling classes, consisting largely of established bankers, traders and wool producers, were confronted with serious economic problems such as bankruptcy, sharp devaluation of their currency, the 'Florin', due to a steep fall in the ratio of gold to silver, and rebellion of the local wool workers (the Ciompi revolt). At the same time they faced political troubles such as the war against Lucca from 1336–1338, the tyranny of the Duke of Athens (1342–1343), and the victory of the popular government over the oligarchy (in 1343). In addition to these social turmoils, a shortage of consumer demand and labour supply in the economy, as a result of a severe famine in 1347 followed by the Black Death, made things even worse.

3.1 Crisis and renewal

This period essentially weakened the power of the ruling guilds in their capacity to exclude new innovative players from entering their business. It also led to new economic and political institutions that favoured empowerment through entrepreneurship across all social strata.

These institutions were not designed by a well-meaning social planner, as neoclassical welfare economics assumes, but were a by-product of the struggle of the underprivileged for more political and economic participation in the city. Yet, the parties involved did not see the struggle as a zero-sum game, where one party wins and the other loses, but favoured formally established political and economic platforms of negotiations where com-

promises could be reached in mutual respect. The poor did not primarily insist on the redistribution of wealth and power but rather the creation of economic opportunities that would allow them to improve their economic situation gradually, enable them to invest more in the health and education of their offspring and to ensure that they would have more possibilities to fulfil their potential. This pressure resulted in the establishment of countless elementary and abacus schools where the youth learned how to read, write and calculate. Moreover, everyone learned the basic principles of accounting.

3.2. *The poor are more than blessed objects of charity*

After the uprising of the wool workers, known as the Ciompi revolt in 1347, the poor were regarded with increased suspicion by the ruling elite. This partly explains why charitable institutions such as the Ospedales and Confraternities, which were largely funded by the guilds to give charitable support to the less privileged members, went into decline in the second half of the 14th century. It is therefore all the more surprising that the period that followed the upheaval is characterized by relative social and political stability compared to other regions in Europe. Obviously treating the poor with some suspicion, rather than as blessed objects of charity, also implies taking them more seriously as players who collaborate and compete with the rich in many public institutions. If the privileged treated the underprivileged with suspicion they were probably also more likely to keep the level of discontent among them as low as possible by integrating them better into the economy. This integration was possible because even the poor were now literate and able to do basic accounting. It became more attractive for companies and artisan workshops to hire poor yet educated young people. The master–apprentice relationship gave them additional valuable on-the-job training. Such training involved not just basic business practices and techniques in a particular field but also joint trips to nearby cities or even work in a branch in a foreign country. This made the trainees more familiar with other cultures and languages which enabled them to learn and understand different points of view. Even though they could not count on formal employment contracts they were still partially protected from abuse by the guilds and the formal political institutions in Florence. Moreover, the fact that they had to work for several different masters in several different fields gave them more versatile professional skills and a greater sense of autonomy. The most important aspect of this education was, however, that they were always in personal contact with the rich of Florence. These wealthy people did not despise entrepreneurial spirit and were very much concerned in their economic and political activities to foster a

spirit of merit-based pride and self-confidence among all the citizens of Florence.

3.3. *The tools of empowerment*

The tool of empowerment that created social mobility and an unseen productivity and creativity among its citizens was therefore a social network that was supportive of the young and skilled people who wanted to set up their own business. Moreover, there were economic institutions in place that allowed these skilled people to gain access to credit, investment and well-trained employees.

One of the important economic institutions that made entrepreneurship attractive was the concept of partnership. Partnerships (*compagni*) were a fully evolved institution at the end of the 14th century. Men joining together as *compagni* (e.g. merchant bankers, artist-investors) drew up articles of association according to which they agreed to contribute capital towards a business venture usually lasting from three to five years. The articles of association would specify each partner's contribution to the capital and how his share of profits was to be determined among other things.

3.4 *Public-private partnerships to facilitate social and economic development*

These small companies had no need for fixed capital, neither property nor equipment. The head office of the firm was presumably located in the residence of the principal investor, and branch offices and warehouses were rented. Partners could commit further capital on specific terms (e.g. time deposits from outsiders).

The fixed capital necessary to introduce a new product or technique to the market required major investors, however. The Medici regarded the holding company as an appropriate tool for that purpose in the 15th century. By using one partnership to invest in another, the original investors clearly increased the capital they controlled, but they hardly exploited this possibility. As the leading international merchants, the Medicis were also investing in foreign companies that seemed to be highly innovative in the production of high-value goods. Subsequently, they invited the most skilled workers of these companies to set up shop in Florence and train local people; the import of know how in tapestry art and production from the Low Countries illustrates the case well. In addition, the Medicis established and funded artistic workshops under their supervision, creating a state enterprise for the production of objects of great luxury and prestige. Many of the invited local and foreign artisans and artists were put to work in the Palazzo Vecchio, the official residence of Cosimo di Medici I; later also in the Uffizi as well as the Palazzo Pitti and its gardens. The state enterprise they established

included the production of goods that required precision work and demanded familiarity with the latest insights in science and technology. The goods produced included clocks, quadrants, compasses, armillary spheres, terrestrial globes, astronomical and geographical maps, glass instruments and lenses.

Since the Medici were always either de-jure or de-facto the political power in Florence throughout most of the 15th century, one could talk of an entrepreneurial government that emphasized the importance of public-private partnerships and private initiatives to enable people to make optimal use of their skills and thus lift themselves and their families out of poverty.

This investment in human capital, the promotion of entrepreneurship and the relative political stability helped prepare Florence for the regionalization of the western Mediterranean economy thanks to the transport revolution (improvement in sailing and navigational techniques) that emerged in the second half of the 14th century. Even though Florence could not become a maritime power itself, it managed to take full advantage of the new opportunities in trade because its people had unique skills and sold products that were highly in demand.

At the same time, Florence was less prone to being strongly affected by external economic shocks, due to the robust middle class that emerged owing to the institutional reforms. This middle class had a decent amount of savings (as documented in the increase of bank deposits at that time) and, whenever the exported-oriented markets in Florence lost an important regional market to rivals, the shock could always be absorbed by resorting to the home market and selling more goods in the region.

3.5 *Dealing with the church*

There is no doubt that poverty, social inequality and criminal violence were nevertheless widespread in the city of medieval Florence. Such phenomena always appear once people gain more political and economic rights because many tend to abuse them. Moreover, the city was almost permanently at war with other Italian states and other European powers. Yet, all these wars mostly occurred outside the city walls and apparently did not affect the economy within the city in any lastingly negative way, judging from all the major public works that were funded and accomplished in the 15th century [26].

The business spirit of Florence had, however, a potential opponent in the Church, which warned about the divine punishment awaiting people who dedicate their lives to making profits. Avarice and usury were regarded as major evils and in Dante's Divine Comedy and a particularly

painful punishment was designed for those who indulged in it. Yet, the churchmen in Florence were also well aware of the importance of wealth generation for the city to flourish as well as for the support of their social institutions. Moreover, they were also aware that it was more difficult to impose religious oppression on well-travelled people with cosmopolitan values [26]. For the rich who were still concerned about the afterlife, the church went a long way towards allaying their anxiety via confession and the institution of purgatory. The Church put instruments at the entrepreneur's disposal, such as commemorative masses, private chapels, donations to welfare and religious institutions and the patronage of religious art. In terms of usury, an accommodation of theology to practice was made. Florentines, at whatever cost to their conscience, found handy ways to circumvent these restrictions – or made gestures of atonement in their final testaments. Churchmen in return tried to adjust doctrine to reality. They were even paying low interest rates for loans to build Monte di Pietà, a religious institution designed to aid less fortunate people by providing an alternative to the Jewish money lending system [25].

3.6 Supportive humanist ethics

Humanists who had close relations with the entrepreneurial class in Florence further pointed out the positive aspects of entrepreneurship for society. They used the classical concept of magnificence to explain that wealth is good for the individual because it liberates him from constraints and, in turn, allows him to liberate others from their constraints. Moreover, it was argued, it helps one to become virtuous and to participate in civic life [26] [27].

Interestingly, humanists were much less concerned with the generation of wealth than with the question of how to spend it wisely [25].

3.7 Good governance facilitated by the people of Florence

In Renaissance Florence, the underprivileged seem to just have followed the evident principles of political economy using their informal networks to lobby for rules that were more conducive to entrepreneurship and empowerment. In turn, the privileged were not just rent-seekers living off the taxes and land rent, as was usual in the period of feudalism, but were engaged in international commerce and business development. In other words, the political and economic institutions were largely a bottom-up process designed by people who did not regard politics as a non-zero game. These institutions allowed for long-term business planning by increasing predictability and reducing uncertainty.

No one had the pretension at that time to know how economic development itself should be designed by means

of a wise social planner (as neoclassical welfare economics still does). The adoption of top-down planning emerged only with the rise of economic theory in the 19th century and reached its climax with the use of linear programming and general equilibrium models to predict future economic development. Many of its models were first developed in communist countries but were then adopted in neoclassical welfare economics. All are based on a purely rational and materialist view of the human being. While it was naïvely assumed in communism that this individualism would be moderated by the common long-term goal of a utopian society characterized by ubiquitous social equality, modern economic theory started from the equally naïve assumption that every individual grows up in a social vacuum and is endowed with a sort of innate knowledge or rationality about how to pursue his or her material self-interest.

In the capitalist society of Florence, the term “individualism” would not have been comprehended [25]. No one could imagine himself to be someone outside his family, his guild or his social network. There was still a full awareness in the commune that things can only be achieved together. It was this corporatist spirit that made Florence competitive and humanist alike. This great period in human history allowed people to explore the world and take advantage of its opportunities because they had a solid base of social support. It also enabled them to become risk-takers and innovators. Their achievements not only benefited them as individuals but also their commune and, ultimately, all the subsequent generations worldwide because their activities are found in the great archives they left behind documenting all the disciplined and formal activities of this time.

Conclusion

The current economic downturn will have an impact on future academic research and training, especially in the fields of ethics and economics. These two academic disciplines have up to now enjoyed great prestige in the social sciences and public policy due to the general belief that they could provide reasonable guidance in a fast changing and increasingly interdependent and uncertain world. Yet, both disciplines are still largely based on an abstract, mechanistic and ideal view of the human being, either as the purely selfish and rational homo oeconomicus or the purely reason-guided Kantian ideal that follows rational and abstract moral laws in daily life. Not only the current financial crisis but also field research and laboratory experiments in cognitive psychology and experimental economics have rebutted such claims of an ideal human being. Instead the real nature of the human being as an active searcher for patterns in life that provide orientation and meaning and guidance in a constant adaptive process of trial and error has been re-

discovered. It is now increasingly recognized that public policy should focus on the real nature of the human beings rather than any form of abstract ideal. The human being must always be embedded in a community that provides essential material and mental support, spiritual meaning, social trust and a sanctuary to test out the adaptive rules that help guide a successful life. At the same time, everyone has to realize his or her potential and make a living by learning to compete and cooperate with people beyond his or her community. The success outside the community can then feed back into the community by enriching it by means material support and the introduction of new knowledge. All these insights hint at the fact that capitalism thrives best in a world where individuals are strongly embedded in community activities.

Inspired by the ideas of Rousseau and Freud, a cult of individualism – unrelated to the system of capitalism as such – has led many people to feel that they need to separate themselves from their original community (including parents and siblings) in order to find their true selves [28]. Yet, since the belief in the true self is again grounded in a sterile idealist view of human nature it has not led to liberation but merely resulted in like-minded and rather boring 'Ersatz'-families [29].

Unfortunately, many of these searchers for their true selves pursue high-minded ideals in life and often end up working in teaching and development cooperation where they tend to spread these false beliefs and inadvertently produce a culture of victimhood rather than entrepreneurial initiative.

Africa's education system is in urgent need of a radical reform. Such reforms will allow it to drop outdated theories in ethics and economics in school and university curricula and instead directly focus on the new empirically well-established insights about the real nature of the human being. This article highlighted that these insights are not new but constituted an essential pillar of humanist education in Renaissance Italy many centuries ago.

Education and public policy in Renaissance Florence could provide a template for a project to reform education and vocational training in Africa.

Even though macroeconomic theories and ethics outside theology did not exist in Renaissance Florence, economic and social policies were firmly grounded in the anthropological observation that human action is and has always been guided by emotion as much as reason. The social and economic institutions at that time were not planned from above but grew from below. As a consequence, public policy was based on the proper understanding of real human nature rather than derived from an abstract ideal.

As in Renaissance Florence, every child in Africa should leave elementary school with basic writing, reading and calculating skills. Subsequently they should be trained in modern secondary schools that provide solid knowledge in IT/ICT, accounting and the basic rules of running a business in the formal sector. This education would be linked to formal apprenticeship training in the local private sector, if necessary subsidized by the public sector. Access to university should be based on an overall entrance exam together with a certificate of experience from the local private sector, which would prove that applicants are not just good at theory, but also know how to apply knowledge in business practice. After all, the goal of education cannot be merely to educate bureaucrats but also entrepreneurs who generate private and social wealth and thus contribute to the emergence of an empowered middle class. The experience not only of Renaissance Florence in the 15th century but also many successful emerging economies today has shown that an empowered middle class is ultimately a condition for a functioning democracy, the respect of essential human rights and governments that start to invest in their own people.

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SCIENCE EDUCATION IN THE NEWS

SCIENCE TOOLS IN THE CLASSROOM

By Peter Horszowski

Would it change your attitude to practicals and field work if you could measure anything you liked? Force, motion, pH, pressure, carbon dioxide, light, heart rate - just about anything, really. A new system from PASCO Scientific allows you to do that. And not just measure, but store, record and analyse the info on your computer as well.



SPARK Science Learning System is an all-in-one mobile device that seamlessly integrates the power of probeware with inquiry-based content and assessment.

Source: www.pasco.com

It consists of a choice of sensors, software and a USB link. There are about 50 sensors currently available and more under development. A user would simply plug the link into a USB port on computer, and attach a sensor or a combination of sensors. The software automatically recognises both device and sensor, while the computer provides the power.

On screen start/stop controls and a number of different data displays such as meters, digits, tables, scopes and graphs provide easy control and access to information. USB being a very fast communication technology means that the device will not only measure multiple quantities simultaneously, but it does it extremely quickly, over 20 000 times a second, if necessary. The need for such high speed is obvious for experiments on motion where velocity and force change significantly during each millisecond. But sometimes it is the slow sampling which is the most

handy. Taking data every half hour or so, for instance, would be more appropriate for a 24 hour examination of pH change in a fish pond.

There are a number of advantages to this computer based system:

- It is cost effective. Because the link and software is the same for all sensors, simply add a new sensor for a range of new experiments. If the initial system was used to monitor motion and force, for example, a very small investment later for a temperature sensor, would open up a range of thermal investigations in physics, chemistry, biology and geography.
- More time with data and less with measurement. Because it is quick and easy to get accurate data, less time is spent on measuring and more time analysing.
- It is flexible, so you can easily change parameters, for scientific investigation. In collision experiments it is simple to alter the mass, change the pulse, track angle, for example. And then again it is easy to get data if you wonder "what happens if"...
- It opens doors. Some experiments can't be done without technology such as this. If for example you drop a magnet through a coil attached to a voltmeter, all that is seen is a flick of a needle. But if the coil were attached to a voltage sensor the emf spike could be recorded exactly. And it could be analysed: on a time graph, zoomed up to a very fine time scale, and then integrated under the curve for exact quantitative results. In theory it would be possible to do the slow sampling experiments without this technology, but who wants to wake up at 3 am to take a humidity measurement in the terrarium?

In Southern Africa, this technology could have specific advantages.

It stimulates enthusiasm for science. With the sensors, students feel like real scientists - not just going through those old clunky motions, hoping that results match the worksheet. Also a bit of competitiveness and spirit can be introduced. Adele Botha, from Cornwall Hill School in Irene, challenges her students to use their own motion with an ultrasonic mo-

tion sensor to match pre-arranged velocity and displacement graphs. The software scores performance which generates healthy competition between groups and classes. Another spur to enthusiasm is the Xplorer, which works not just as a USB sensor link but a datalogger with display. Students can use it for outdoor work and ad hoc investigation. The American International School of Johannesburg, for example, used an Xplorer for temperature levels in the Northern Province during the 2002 eclipse.

It encourages female enrollment in science. Case studies have demonstrated this effect. John Layman from the University of Maryland, suggested that it was because of a leveling effect. These days, girls and boys are equally familiar with computers and computer accessories but the traditional practical equipment, like stop watches, calipers and multimeters were thought of as 'boys stuff' .

But for this system to work in the southern African setting, access to computers, computer literacy issues and overburdened teachers need to be addressed.

Fortunately, some of these difficulties can be overcome by creative teaching. Some South African schools for example, use projectors, large monitors and TV adapters to use the probeware as part of a teaching demonstration, instead of a separate practical. Because it is quick to set up and very visual, a lot can be achieved in a lesson that incorporates a computer based demonstration. Homework can be useful too. Students save the results to disk and analyse them later, wherever they have access to a computer.

The shift towards outcomes based education also gives some assistance. The Pasco system's flexibility lets the learner approach a variety of objectives from different angles via a number of interrelated sciences. And the centering of the learner gives scope for individual tangential investigation without overburdening the facilitator.

Documentation is available for several hundred experiments and new experiments are posted on the internet regularly. For examples of these see www.pasco.com/experiments. Worksheets allow participants to become familiar not only with the utilities but also the possibilities, so that they can get creative with new types of experiments. Dawn McMaster of the American school has been using the probeware for a few years now. She says that she enjoys customising her own experiments and that, given the choice, the students prefer the Pasco sensors for experimental work.

There is no single solution to the problems facing science educators in Southern Africa but this kind of technology could help.

For information on the latest USB PASCO Probeware for Science Learning, please contact Peter Horszowski at (011)882-1435 or peter@pert.co.za

Source: Adapted from www.scienceinafrica.co.za

The online resources for educators and students includes manuals and experiments in the core science fields: biology, chemistry, environmental and earth science and physics.

