

The Role of Everyday Culture for a Scientific Orientation in Philippine Society: Are the Youth Any Different?

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This paper discusses the attitudes of Filipino youth towards science and technology. While the sample is derived mainly from elite educational institutions, the paper is more concerned with exemplarity rather than representativity. Moreover, the paper contextualizes these orientations around the culture of everyday life. It seeks to relate ordinary, often unperceived notions of culture, to attitudes towards science and technology. Notions of competence and achievement, ideas about nature and the environment, expectations of trust, risk, and the future determine the possibilities of developing a culture of scientific research and technological development. Globalization and the new communications media are increasingly pervasive forces in Philippine society. The youth are most affected by these new trends and orientations. Their response to these challenges will affect the future of science and technology in the Philippines. This paper, thus, explores how the culture of everyday life is adopted as well as transformed by the youth in the process of incorporating contemporary practices and responses to modernity.

INTRODUCTION

The aim of this paper is to investigate the cultural construction of knowledge in Philippine society. In particular, it looks at the cultural valuation of scientific practice. I want to explore the relationship between the everyday cultural construction of knowledge and the practice of science. While this relationship is undoubtedly complex, involving the State, the economy and a myriad of institutions from the family to universities, my interest is to expose some overriding cultural assumptions linking local everyday life to the production and dissemination of scientific knowledge.

This paper, thus, explores the conditions for a culture of science in the Philippines. It looks at science as an ultimate cultural value and its practice as an example of the pursuit of cognitive excellence. My interest is to investigate cultural assumptions linking everyday life to the generation of scientific knowledge. This generation of new knowledge is based on the valorization of science. It accepts global standards and insists on contributing to the expansion of science as part of a universal civilizing process. It assumes a degree of reflexivity interested in duplicating and extending the scientific accomplishments of others. A culture of science is globally oriented.

DEFINITIONS AND USES OF CULTURE

The use of culture in recent times has undergone several significant transformations. In its most basic anthropological sense, culture is the framework for organizing the world and our position in it. It is a set of principles that locate and orient human beings within their existential realities. Because culture has to adjust to given realities, its principles are never totally consistent or uniformly applied. Lived-culture is therefore frequently ad hoc, inconsistent and accommodative. Some see culture as a post-hoc reflection of established practice rather than a set of well-defined and consistent rules.

By extension, a culture of science consists of principles and practices whose aims are to explore the natural world in order to bring it under human control. Notions of the natural world and demands to control it are themselves products of culture. Using a western model, science is seen as involving theoretical and empirical knowledge dealing with the world as brute facticity, and using this knowledge both as a value in-itself (an intrinsic cultural value) as well as a tool for the control of nature for human ends. Hence, science consists of understanding the natural world as an end value as well as applying this knowledge instrumentally as forms of technology.

Science in its employment as technology is a feature of all societies even if it is more developed in some than in others. But science as a form of comprehending nature as an ultimate value is a recent feature and was best expressed in western society in the 18th and 19th centuries. It is a product of the

progressive secularization of European society and associated with the growth of capitalism as well as the spread of colonization. Hence, a culture of science is derived from a broader European secular tradition that views nature (and by extension society) as ultimately amenable to human understanding and control. How well a culture of science can flourish in other (non-western) societies is an empirical question. My interest is to explore the compatibility of a culture of science within the features of everyday Philippine life. Do the features of everyday life support or hinder a culture of science?

SCIENCE AND THE YOUTH

The students interviewed and surveyed for this paper come from leading schools and universities and, therefore, are not representative of the general population. Nevertheless their attitudes and expectations regarding science give us an insight into the future of technology in the country. Furthermore, since this paper explores the cultural assumptions of everyday life and their relevance for science, the youth may well reveal new cultural approaches to modernity. The rapid acceptance and creative use of the new media, such as cellphones and the internet, by young Filipinos give us an indication of major cultural transformations affecting everyday life. Whether these transformations will have a significant effect on local scientific and technological practices remains an open question.

SCIENCE AND GLOBAL CULTURE

Globalization is exerting increased pressures for the Philippines to improve

its technological expertise. While the rhetoric on the importance of technology is extensively circulated in the media and even among politicians, there is very little investment in the scientific infrastructure of the country. The government's frequent claims of making the Philippines the region's information technology (IT) center by 2004 is mainly rhetorical. Any objective assessment of the country's scientific expertise points in the opposite direction. The index of scientific publications is one of the lowest in the region. In the period 1981-1992 the Philippines contributed four percent of the refereed science publications in Asia. Singapore with a population under four million people contributed 10 percent (Lacanilao 1994). Since then Singapore has doubled its number of publications from 502 to 1270 while the Philippines increased from 209 to 224 (Lacanilao 1999). Even the less ambitious notion of providing lower and middle-range IT workers (Ramos Report 1997) such as call center operators is constrained by the low quality of English language competence of most students.

Nevertheless, the regular comparison of the Philippines with its more advanced neighbors may be expected to result in practical changes to educational practices affecting science. Most universities and colleges now regularly admit the importance of research and require their faculty to complete graduate degrees. Secondary schools offering international curricula for their Filipino students are growing and even public schools are entering into linkages with overseas foundations to provide access to advanced technologies. None of these trends are likely to result in significant change unless the underlying culture of

knowledge construction changes correspondingly.

Most of our young informants enthusiastically use their mobiles and the internet in everyday practice. Some see the potential of these media to expand their knowledge base but others use it mainly for entertainment and distraction. These diverse uses are neither incompatible nor contrary to knowledge construction but they indicate that other changes in orientation have to be present for these media to achieve social transformations. So far we only have evidence for changes in private attitudes rather than in collective orientations but it is too early to assess the full implications of communicative technologies (Pertierra 2006).

THE INTEREST IN SCIENCE

There are many practical, historical, economic, and political reasons for the lack of interest in science. The relatively low salaries and social status of scientists as well as their lack of influence in public life, discourages the pursuit of scientific competence. Why is this competence given little social or cultural value? Is this because scientific knowledge depends on objective and impersonal criteria rather than on the personalized networks Filipinos normally use for success? Moreover, scientific competence is achieved rather than ascribed, this latter being the favored approach of most Filipinos.

The Filipino disinterest in science may be traced back to the Spanish colonial period. While some aspects of science were practiced by the Spaniards (e.g., meteorology, botany, agriculture,

medicine), Filipinos rarely had the opportunity to develop a serious competence in it. Certain aspects of scholarship (e.g., humanities, theology and ethnography) were comparatively developed in the Philippines under Spanish colonialism but science and technology were generally neglected. This reflected the poor state of science in the motherland. In addition, while Filipinos were eventually allowed to engage in advanced studies at the end of the Spanish period (1850-1896), access to an adequate training was limited to the Universidad de Santo Tomas in Manila. Only wealthy Filipino men or exceptionally talented ones had access to a higher education. Like their colonial masters, they generally preferred humanistic training above technical expertise.

Rizal criticized this lack of interest in natural science on the part of Spanish colonial officials, when he was a medical student at the Universidad de Santo Tomas in the 1880s. In contrast to this Spanish indifference, the Americans characterized their colonial regime as one founded explicitly on modern science (McFerson 2002). A serious program of compulsory vaccination and a greatly improved system of sanitation marked their governance (Anderson 2006). They conducted original research in the fields of tropical medicine, agriculture and anthropology. These three areas are more intimately linked than generally assumed. They all rely on instrumental approaches to nature and society. In addition, the new colonizers introduced more democratic practices, including the expansion of government structures. The civil service was greatly expanded, providing opportunities for an emerging class of

educated people. The increased democratization of society required an equivalent expansion of structures of knowledge. Not only were future citizens expected to be better informed than colonial subjects but a modern workforce also had to be more technically competent. However, despite these apparently beneficial colonial orientations established by the Americans, Philippine science has not flourished. Is local culture partly to blame for this lack of interest?

One of the first acts passed by the Philippine legislature (1933) when it took over local funding was to severely reduce the allocation for scientific research (Caoili 1991). The Bureau of Science, established in 1905 established an international reputation for basic research and its directors went on to establish high reputations in leading American universities. Andrew Sellards, Richard Strong, and Victor Heiser made important discoveries in epidemiology and public health (Garcia 2003). After Filipino politicians depleted funding, the Bureau of Science became a victim of the policy of decolonization. Basic research was seen as irrelevant to the needs of an emerging independent colony. The young nation-state failed to see the link between political and cultural modernity. The particular requirements of a knowledge regime and its special affinities with an egalitarian democracy are still not fully appreciated a century after the founding of the Bureau of Science.

SAMPLES AND INFORMANTS

In this study, 80 university science majors and 80 secondary-level students

were interviewed to identify cultural assumptions, expectations, or values relevant to scientific research and practice. While our initial informants were based at the University of the Philippines and the Ateneo de Manila University, we also interviewed students in other institutions such as De La Salle University, University of the Philippines in Los Baños and Iloilo, and San Carlos University in Cebu, to ensure that their perspectives are not just institutionally bound but represent common cultural orientations. The secondary-level students mostly came from De La Salle Greenhills and Manila Science High School.

While our sample was limited, we believe it has an acceptable degree of representation. Unlike other studies of scientific practice that look at the culture and ethos of the laboratory or a small community of researchers (Latour 1986), we are more interested in identifying cultural attitudes pervasive among Filipinos, including scientists and students. In other words, we are interested in seeing how the culture of everyday life operates (largely unperceived) and affects attitudes towards the construction of knowledge of the natural world.

The final results of this project will assist not only in understanding the role of science in Philippine society but also in formulating practical structures for its expansion and development. This has implications for education at all levels, from primary schools to graduate programs. The poor performance in science and mathematics of Filipino students (Third International Science and Mathematics Study 1999 – Filipino children scored the lowest in Asia) compared to their global counterparts is

a major concern. Apart from economic and pedagogic factors, there may also be underlying cultural factors that affect their performance.

SCIENCE AND YOUTH: ANY DIFFERENCES?

We surveyed science students in several schools and universities to ask their views on aspects of science. The following results represent areas of high consensus among respondents. The students came mainly from prestigious and well-equipped schools and universities; hence they are not representative of the general student population. Since my interests focus on cultural orientations, I was more interested in exemplarity rather than representativity.

SURVEY RESULTS

1. Students agree overwhelmingly that gender is irrelevant for an interest and competence in science (89%).
2. They agree that science courses are demanding (90%).
3. They also think that Filipinos are naturally good in science, as they are in music and the arts (88%).
4. They enjoy studying science (87%).
5. They agree that science has a good future in the Philippines (83%). But they also complain about the lack of government support for science, the lack of jobs, poor training and low salaries. These incongruities also surface in other ways. Hence, while students (85%) are satisfied with their science teaching, they are much less impressed about their science laboratories (55%).

6. Most students (65%) agree that television is the most effective media to present science, with the internet a close second. Radio and newspapers score very poorly in their assessments of the presentation of science. Evidently these respondents represent a visual and digital generation. But many also admitted that they develop their interest in science by reading.
7. As expected many (50%) respondents claimed that their family encouraged them to study science but the influence of teachers (13%) and personal decisions (19%) also played significant roles. While these results indicate the influence of the family in shaping decisions to study science, there are signs that young people are increasingly weighing their options beyond family influence. However, the significance of the family in providing cultural capital is very strong. Values of achievement are part of this cultural capital.

There are also some interesting differences between university and secondary students. University students (93%) are more emphatic than secondary students (87%) about equal gender competence. However, university students (84%) enjoy studying science less than secondary students (91%). Evidently some enthusiasm for science is lost in the transition from secondary to tertiary schooling. Moreover, although both groups equally agree (57%) that ethnicity is also irrelevant for science; their agreement is considerably less than it is for gender. Ethnicity and gender attitudes appear to reflect more general societal views. A significant number of students from both groups (18%) also accept that gender may be relevant to an

area of science such as women/biology or geology/men. It seems that while gender equity is accepted, gender roles are still significant. As others have observed (Wajcman 1991), it is not the case that gender determines an interest in science but rather that science expresses itself in terms of gender. This may be the effect of gender segregation in some secondary schools. The case of ethnicity is more complicated and may be due to social segmentation rather than cultural orientation. This indicates that ethnicity in the Philippines is as much an instance of class as it is an expression of culture.

There are also other interesting differences. Secondary students (93%) are more certain than university students (79%) about maintaining scientific objectivity in relation to religious belief. Yet secondary students (57%) are less certain than university students (65%) that science can explain miracles. Both groups (81%) admit the importance of precautionary rituals (e.g., making the sign of the cross) in everyday life. It appears that a university science education creates a degree of cognitive dissonance about the relationship between science and religion. This is supported by the admission of their possible conflict – university students (52%), secondary students (46%). University students (74%) appear to have a greater secular awareness about the relationship between natural disasters and reputedly divine causes than secondary students (56%). This possible growth of a secular consciousness will have to be further explored for confirmation. Since science is a conscious choice at university level rather than a requirement at secondary school, this

divergence may reflect the rise of a professional orientation towards science. However, as our data from university faculty indicate, professionalism does not necessarily result in a developed secular consciousness. Many university professors readily admitted the integration of their religious and scientific views. Private religious beliefs and the public world of science are not seen as separate domains. This conflation of the private with the public sphere is a major feature of Philippine culture.

The question about the disenchantment of nature is explored further in this project. Suffice it to say that, as expected, students share many of the general cultural orientations about nature. In their view nature is animated and operates according to its own interests. Human beings have to show respect to these environmental spirits or risk illness. Students participate in protective rituals but are evenly divided about the explanatory powers of science regarding miracles. There is a tendency for males to be more positive and secular about these matters.

All students agree that science and technology can bring many benefits to the country. Among these benefits are improvements in health, in agriculture, industry, disaster prevention and environmental resources. However, students are generally unaware of any special programs in science and technology, can rarely name prominent scientists, much less organizations and seldom belong to clubs or groups promoting science. Since the students interviewed are science majors (except for secondary students), their lack of familiarity with the practical applications,

uses or organizations of science and technology is surprising. A major government bureaucracy such as the Department of Science and Technology barely rates recognition by most students. There is an almost total absence of role models taken from science or technology.

Another unexpected result is the low preference in using science and technology to prevent natural disasters and environmental degradation, despite the fact that these topics are frequently in the media. Students generally share broad community views about an animated nature and see disasters as moral lapses deserving retribution rather than as a natural event amenable to technical control. In this sense, new age views of nature transmitted by popular culture merge easily with traditional Filipino beliefs. On the whole, there is vagueness about the practicalities of science and technology other than in the pursuit of personal careers. It is as though science and technology is seen mainly as a career possibility rather than a societal resource. For this reason, ICT and other high profile applications of science are the most frequently alluded to when asked about future prospects. This personalization of knowledge seen as a strategic gain rather than a cultural good is a reported feature of Philippine academic life (Lacanilao 1994).

Students, both at secondary and tertiary levels, are much more optimistic about the prospects of science in the Philippines than their teachers. This is presumably because these students have not yet entered the hard world of work and experienced the low priorities given to science in the government and private sector. But this optimism is possibly part

of a general awareness of the necessity to harness science for problems such as global warming.

THE CULTURE OF SCIENCE

The views expressed by our student informants often conform to major aspects of Filipino culture. How consistent are these aspects with a culture of science? While the above-mentioned historical, economic and political factors go a long way in explaining the parlous condition of science in the Philippines, they do not completely explain it. An important missing ingredient is culture. While culture is a product of practical, historical, economic and political conditions, it cannot be reduced to any or all of them. Culture also shapes notions of the practical, the historical, the economic and the political. These latter are also implicated in a view and conception of the world. Many Filipinos complain about the undeveloped social interest in the pursuit of excellence (Lee-Chua 2002). A culture of achievement is not strongly developed among Filipinos. Simply getting by rather than attaining extraordinary results seems to be the prevailing attitude. Amateurism rather than a developed specialization characterize most walks of life, from sports to science.

CULTURE OF SERVICE RATHER THAN EXCELLENCE

Many Filipinos eagerly study nursing and other service oriented courses because they see these skills as leading to employment overseas. Having succeeded abroad in their respective fields, many of these workers return to their original villages to invest their

overseas savings (Pertierra 1992). They open small stores, invest in tricycles and passenger jeepneys, or loan their savings at high interest rates. Others spend their savings in political campaigns. In other words, they engage in familiar forms of rent-capitalism, where personal contacts and social skills are favored over technical or professional competence. Their experiences abroad are seldom developed to diversify local skills. Instead they revert to traditional forms of petty commodity production and exchange. Many studies have shown that while the personal lives of these migrant families may have improved, there is virtually no gain to the community as a whole (Griffiths 1978). In fact, overseas labor often widens the gap between those who can invest in this activity and those who are too poor to go abroad (Pertierra 1992).

NATURAL AND CULTIVATED SKILLS

The view that Filipinos are uninterested in science is prevalent (although many of our informants disagreed with this perception) and contrasts with the equally strong perception of the Filipino's musical and social skills. But the latter are seen as naturally imbedded in Filipinos rather than achieved through a long process of disciplined learning. Networking and negotiating skills are necessary for everyday Philippine life. Most Filipinos learn these skills as an ordinary aspect of cultural life. The variations on the notions of *pakikisama* and *pakikipagkapwa* (Enriquez 1990) indicate a nuanced orientation towards others. This orientation includes performance skills such as singing, dancing, oratory, and

other abilities to entertain, amuse, praise, or disparage.

The importance of the middle class for a culture of excellence is well established but their socio-critical function in the Philippines is severely constrained by their economic dependency. The structural weakness of the Philippine middle class prevents it from exercising a steering function in the nation's cultural life. Instead, this steering function is dominated by the elite's understanding of culture, a view which sees it as a form of display. By contrast, the middle class views culture as involving an understanding of the fundamental artifactuality of social life and hence of the limitless possibilities for constituting human society. A view of culture which sees it not only as negotiable but also as arising out of rationally defensible criteria involving cognitive and technical judgments, encourages its public discussion rather than simply its private accumulation or consumption. Culture is simultaneously an appreciation of the existing human condition as well as an expression of its counterfactual possibilities. It is this latter concern which members of the middle class are best able to explore. Until their members play a more significant role in its constitution, the Philippines will remain not only a bastion of an uninformed elitism but also trapped in populist misconceptions. It will not be able to generate a culture of excellence in the sciences, the arts or sport.

CULTURE AS EXEMPLAR AND MODEL FOR LIFE

A paradox of modernity is that while cultural relativism has become an

acceptable perspective, the notion of culture as exemplary practice is also firmly established. This does not only concern areas in the arts and the humanities but also in the natural sciences. The notions of elegance and minimalism apply as much to mathematics and architecture as they do to painting and literature. In this sense, culture now becomes the pursuit of autonomous values expressed in science, law and aesthetics. It becomes synonymous with civilization and is contrasted with brute and untamed nature. The latter now comes under the instrumental control of culture. This not only involves enjoying the "fruits of nature" but also altering its genetic content to conform to our desires. Knowledge for knowledge's sake becomes an end in itself, irrespective of its social and moral consequences.

Filipinos rarely see nature simply as brute facticity, open to human manipulation. Instead, nature is often seen as animate with its own autonomous ends. Humans must take cognizance of this autonomy or risk the consequences (Zialcita 2002). Is this view of nature compatible with a scientific and technological orientation? I discuss the implications of these orientations later. At this stage, I simply point out the connections between conceptions of the natural order and an instrumental orientation towards it.

CULTURE OF BRICOLAGE

What are the main features of a national culture in the Philippines? Whose interest does this national culture serve? Does it pursue excellence and other exemplary values or is it content

with an immediate instrumentality? Does it see itself as equal among sovereign cultures and therefore obligated to contribute proportionately to the world's achievements in civilization and technology?

It seems that the country sees itself as derivative and limited to reproducing existing cultural forms. Is Philippine culture simply bricolage, content with producing the jeepney and endless variations of traditional handicrafts or is it capable of more original and significant achievements? Can a culture of bricolage inspire and inform local science and technology? The initial creativity of the jeepney has not been developed much further, except for minor variations. This phenomenon of internal elaboration rather than external growth is known as cultural involution (Geertz 1971). This refers to a growing elaboration of a given theme such as the complex patterns of Indonesian batik or European rococo, rather than the development of radically new themes typical of modern art. The two approaches may be combined but this requires a reflective awareness of both practices. Filipino technologists have not applied their engineering skills to develop the jeepney into a more appropriate vehicle. Instead, locals have simply adopted another vehicle, the FX-Revo to serve present transport needs.

CULTURE AND SOCIAL INTERESTS

Since culture is a product of contestation, its reproduction depends on the social interests that it represents. The notion of knowledge in the Philippines as a personal and local asset, to be guarded against interlopers rather than a public resource for the general good, is

one such social interest. It explains the preponderance of patrons and factions even in academic and professional associations dedicated to a common body of scholarship. This politicization of knowledge invades areas of technical expertise and prevents their autonomous development.

Lacanilao (1994) has discussed how this politicization of knowledge as a scarce resource to be shared only among selected participants prevents the general development of expertise. Personal ties rather than professional competence determine the structure of opportunity for scientific development. Higher degrees are seen mainly as an exercise in accreditation instead of as a preparation for further research. Once completed, theses are generally not published and hence do not contribute to the public world of scientific knowledge but only to a personal career. Scientific competence is constrained by wider cultural interests preventing its full development.

A CULTURE OF MULTIPLE REALITIES

A common Filipino view of nature often involves a conflation or interpenetration of multiple realities. Red tide is not just the accumulation of microorganisms; it is also an imbalance of moral interests between human and non-human agents. Bankoff (2003) reports that many natural disasters in the Philippines have been associated with supernatural warnings about incoming catastrophes such as deluges, volcanic explosions, earthquakes, and typhoons. The notion of a material world governed by discoverable laws instead of by fate,

chance or the unpredictable dictates of supernatural powers is still uncommon even among educated Filipinos. This attitude towards an unpredictable and capricious nature is paralleled by the experience of the world of culture. In the latter, status, privilege, or power most often determines a social outcome rather than competence or entitlement.

CULTURE OF DISENCHANTMENT

The notion of the disenchantment of nature as a condition for the rise of modern science was one of Max Weber's (1978) main sociological interests. The progressive de-animation of nature and its replacement by abstract, universal laws was a major feature of the Enlightenment. The interpenetration of the sacred and the secular were slowly disentangled. This eventually resulted in separate domains. The public and secular world of science dealt with empirical phenomena governed by discoverable regularities and abstract theories. This knowledge had to be publicly validated and any restrictions on its pursuit were strongly resisted.

Alongside this public, secular world was the private sphere, consisting of deeply held beliefs about a reality whose existence was no longer commonly shared. Religion, until then a public reality, was consigned, after generations of fruitless and irresolvable conflict, to this private sphere. Universities, hitherto repositories of knowledge of the sacred, shifted their attention from theological argumentation to science and public administration. Unexpectedly, both spheres flourished, each enriching the other. Natural science was complemented by the flowering of a critical, aesthetic reflectivity in areas of life such

as art, music, literature and religion. The rise of the social sciences was one expression of this new reflectivity which partly bridged the two separate domains (Pertierra 1997).

This process of secularization and disenchantment took place over several centuries, starting with Galileo's lunar observations, Newton's laws of gravitation, and Laplace's treatise on celestial mechanics. The last example prompted the famous exchange with Napoleon Bonaparte, himself an avid student of science, who asked Laplace what role God played in his explanatory schema. The latter replied that he had no need for such a hypothesis (Laplace.pdf 2003). Nature had been completely disenchanted.

THE PRAGMATICS OF CULTURE

The importance of technological innovation for a country such as the Philippines is obvious. Its rapid population growth, the corresponding loss of natural resources, urban agglomeration, pollution and the lack of viable employment can only be resolved through creative social, cultural and technical means. This paper suggests a reappraisal of these solutions by an improved understanding of the role of culture in assisting technical progress. If one can identify cultural complexes that either assist or impede technical and scientific orientations, one is in a better position to suggest appropriate remedies.

An editorial of the Philippine Daily Inquirer (20 October 1999) asked:

"as a nation, then, are we forever consigned to backwardness and pre-modernism, bound to commit errors of

judgment and short-sightedness because we have failed to develop a scientific attitude that can explain the world and predict its vagaries?"

Only if the world is perceived in certain ways (e.g., unambiguous realities, regularity and predictability, falsifiability, disenchantment) is it likely to result in a scientific attitude. While culture is only one element that shapes this perception, its salience is undeniable. Many of the world's vagaries may be avoided by a better knowledge of its governing structures. Globalization and the new technologies, with their capacities and necessities for coordination, only exacerbate the imperative for a scientific orientation.

THE CULTURE OF RISK AND TRUST

The concepts of risk and trust are cultural constructs that depend on particular structures of validation (Giddens 1999; Luhmann 1979). Pre-modern societies generally limit these concepts to familiar situations while modernity extends them to unfamiliar and novel ones. While pre-modern societies can deal with new emergencies, their notion of culture is embedded in a particular mode of life that sets its own limits. Only when culture becomes aware of itself as a lens through which we see the world, does it become possible to conceive of alternate perspectives of the world. These different perspectives allow us to imagine and prepare for new contingencies.

The imagined future enters into the conception and response to the present. The future becomes present-constitutive. Expectations of the future rather than

experiences of the past construct the present. This future determination of the present raises problems about assessing risks. Actuarial science is a practical response to calculating risks posed by future expectations. New risks entail corresponding structures of trust.

Associated with these concepts of risk and trust are new understandings of the future as predictable or controllable. Time no longer passes in cycles, where the past replaces the future into the present. Instead the future is seen as an open horizon full of new possibilities whose achievement may be comparatively calculated. As the future approaches, other futures emerge with their own horizons of possibility.

FILIPINO SELF-IMAGES

Aguilar (1997) has argued that Filipinos often see the country as a small, weak "feminine" entity easily preyed on by foreigners and therefore requiring protective measures. The Philippines is portrayed as emotionally immature, unable to seek its own destiny in a world of predators. In fact, the country is as big as the U.K. and with a population larger than Germany's. This perception contrasts strongly with Singapore's view of itself as a technological and economic powerhouse in the region. The Philippines will have to change its self image before embarking on a path of economic development. Aguilar argues that this self image is shared across the political spectrum, from left to right, indicating that it is part of a broader cultural orientation. The project of decolonization resulting in the withdrawal of funding for basic scientific research by the Philippine Legislative

Assembly in 1933 shows how entrenched is this perception. The politics of anti-colonialism is extended to include science as part of the project of domination.

Part of this perception of weakness and unimportance is the country's inability to fully participate in the achievements of modernity, of which science and technology are its leading indices. Only in the sphere of political participation and democracy is the Philippines' an exemplar of modernity for its neighbors. Even its accessible educational system and gender achievements have not translated into technical competence. Recently, the expansion of overseas labour has also produced an image of the country as a rich repository of English-speaking IT workers (NITC 1997). Some see the Philippines as a world-center for the production of computer software, particularly of anti-virus programs. While opportunities exist in IT, the major attraction in employing Filipinos is the relatively low wage structure rather than high technical expertise (Saloma-Akpedonu 2006). There is an expansion of IT services and associated industries such as call centers but their long-time viability is still uncertain. In the meantime, educators complain about the rapid deterioration of academic and technical standards. The magazine *Asia Weekly* compared the facilities and resources of universities in Asia in 1999-2001. This revealed the poor state of advanced education in the country.

TECHNOCULTURES

We seem to be on the cusp of a new age! Astonishing claims are being made

by social theorists. According to Barlow (1995:36):

With the development of the internet, and with the increasing pervasiveness of communications between networked computers, we are in the middle of the most transforming technological event since the capture of fire. I used to think that it was just the biggest thing since Gutenberg, but now I think you have to go back further.

The invention of movable print in Gutenberg in the fifteenth century was the impetus for modernity, with its reflective and abstract textuality (Pertierra 1997). The internet makes it possible to return to a more intimate orality on a global scale, with its chat groups and informal networks. The limits of community are confounded when the local, diasporal and global intersect. These new intersections produce distinct hybridities embodied in transformed corporealities.

Barlow makes an even bigger claim, equating the internet with the domestication of fire, the very beginning of human culture. Following him, one assumes that the electronic revolution will transform the human either into the post-human or at least into the cyborg. The routine incorporation of dacron, steel, and electronic devices (e.g., cochlear implant, pacemaker, silicon breasts, aluminum joints, artificial hearts, and synthetic lenses) into the human body transforms it from an organic unity into a techno-formation. The seamless merging of human and machine generate problems for an earlier understanding of culture as distinct from and opposed to nature. In the cyborg, the dialectic between culture and nature is fully established and transcended. Culture not

only informs but also constitutes nature, which in its turn disinforms culture. Brute facticity and human purposiveness merge into the human-machine. The classical distinction between science, as the disinterested pursuit of knowledge, and technology, as its instrumental application, disappears. The post-human subject combines the immediacy of a tool with the effectiveness of a machine. For these reasons, social theorists (e.g., Kirby 1997) are presaging the end of the corporeal and the birth of the post-corporeal or the replacement of the human by the post-human. Others make equally astonishing claims: "We're going to be Gods, we might as well get good at it" or "In another thousand years, we'll be machines or gods" (Gray 2002).

These claims may be premature for the Philippines, with its low rate of internet penetration (8%) even if this usage is much higher for cellphones (50%). Nevertheless, new forms of technoscience have enormous potentials for social and cultural change. Organically modified crops now include human, baboon and tomato genes in weird combinations. Cyber space and virtual reality are new ontologies, often subverting the former continuum of space-time. The global merges with the local into the glocal, disrupting identities based on territoriality such as the nation-state. Homogenous and territorialized cultures are rapidly hybridized, while diasporas are localized. While these claims are exaggerated for a poor society such as the Philippines, their implications are already being felt. The introduction of the internet and the astonishing response to mobile phones gives us an idea of their possible consequences.

Naturally, the youth are in the forefront of these changes and technologies.

YOUTH AND THE NEW MEDIA

We interviewed a group of students from an elite university on their use of the internet. These students, all of whom enjoyed easy access to online resources, explained their experiences as follows:

We think that the internet constrains the cultural skills of people. Too much use of the internet, specifically online chatting causes a person's social and communication skills to deteriorate...Cyberspace is slowly replacing the real world. Cyber-culture weakens interpersonal relations, particularly within the family. Since they mostly meet strangers in cyberspace, people experience emptiness, depression and emotional frustration. High quality relationships are not developed in virtual reality because there is no sincerity.

Through the internet, people get to meet others they would never encounter in real life. They may not interact physically but it is still better than not having the experience. Because of the internet, people can see the world in different perspectives. They are able to know different things such as having complete access to the news. It does not make us less social when we surf the net. In fact, we can gain new friends through email or chatting (Pertierra 2006: 465).

Their comments are ambivalent and indicate unease in replacing the "real" world with its virtual equivalent. The latter does not guarantee the privileges and advantages that the former provides. In contrast, provincial students with more limited resources were less ambivalent than their city counterparts. The latter saw

online resources as more instrumental and as supplementing their poorer material conditions. The internet opened up areas of experience and information not normally available locally.

I often search the internet for definitions and medical terms of diseases for my nursing course. This is easier and more convenient to use than spending a whole day in the library where the information is often lacking.

Jam, a friend and an avid user of friendster, now has two new textmates whom she met in the net. She spends her free time in the internet café.

I often encounter female college students trying to meet foreigners using the web cam.

These latter examples are less ambivalent and see the internet as having instrumental use as well as enabling authentic relationships. However, some poor families have expressed concern about the growing expenditures (Pertierra 2006) for mobiles. Naturally both sets of informants share many common experiences of the new media such as an interest in pornographic and religious sites, games and keeping in touch with family and friends overseas. But another aspect of class or status is indicated by the reluctance of elite students to accept text messages from unknown senders. Elite students express a dislike for these messages and assume that they originate from lower class people. Provincial users generally accept these messages and use them to extend their networks, often establishing new relationships. The internet elicits fewer prejudices because national class markers are more difficult to identify. While the new media benefit members of all classes, they are more

likely to have a transformative effect (but not necessarily economic improvement) on the poorer rather than the richer classes. For the former, the new media open a world hitherto closed while for the latter it provides them with more choices. For both, the new media encourages individual pursuits.

CONCLUSION

The answer to the question—are the youth any different?—is both complex and varied. In some respects the youth are different. They are much more optimistic than their teachers about the future of science. But this may be simply because of their lack of experience. The youth rarely participate in science clubs or organizations, are largely unaware of government scientific institutes or are able to describe their functions and cannot name many prominent scientists. However, apart from enjoying their studies of science, the youth are keen participants in new technologies such as the internet and mobile phones. Moreover, the youth are now part of a globalized world, where science and technology are aspects of everyday life.

These interests in communications technologies tend to orient the youth towards a more cosmopolitan and individualized perspective of the world. While still deeply influenced by the family, many young people are making decisions for themselves and see science as a domain for this independence. There is some evidence to show that the youth are likely to develop a less enchanted view of nature than their elders. This is as much a consequence of the growing specialization of contemporary popular culture.

Youth are generally more tolerant of difference and more comfortable in developing alternative identities and interests. However, they still regard a competence in science, like in the arts, as naturally arising from a Filipino identity. For these attitudes to change there will have to be a more radical transformation of Philippine society. A culture of competence and an emphasis on specialization will have to be more consciously pursued before such a transformation can take place. The needs of a globalized economy, polity and culture may provide the incentives and conditions for this change.

The full impact of the new communications media has not yet been assessed but already there are definite signs that they are changing fundamental

attitudes among the youth. The success of cellphones is phenomenal; they are the first technology that has opened up channels of communication for all Filipinos, regardless of class and status. While the internet is not as accessible, internet cafés in most urban centers allow many of the youth regular access. They now enjoy a virtual cosmopolitanism previously available only to their affluent counterparts. The routine incorporation of the "stranger" into networks of communication can be expected to produce a more artifactual orientation to the world. While the millenarian claims for the new media have not materialized, we are indeed in the cusp of a new age. What this new age will bring depends on how today's youth appropriate the new technology.

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