

Knowledge, Work and Education

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ABSTRACT

With the emergence of the concept of "Knowledge Society" knowledge produced in modern institutions such as universities, laboratories etc., is no longer viewed as the sole legitimate arbiter of all other paradigms of knowledge. Instead the idea is gaining ground that the poor and the dispossessed, while they may be lacking in tangible resources (such as land, water, and capital), have a rich store of intangible knowledge resources that they can use to sustain themselves under resource-poor conditions. For example, observe that over 80% of India's working population, in its informal economy, fulfills its needs and the needs of society largely without reliance on formal education. The knowledge that these farmers, artisans, women, and adivasis possess is found abundantly in society. Restoring respect for this *lokavidya* and ensuring that its holders benefit from their knowledge are important steps towards creating a poverty-free society. However, the communal nature of *lokavidya* makes it difficult to design effective property rights which might ensure that *lokavidya* producers get due rewards for their knowledge-activity. The resulting dangers of biopiracy have motivated the archiving of *lokavidya* in online databases. A new hierarchy is emerging between knowledge that is organized or represented on the Internet and that which is not. As representation on the Internet becomes the new legitimizing criterion for knowledge, the proponents of *lokavidya* find themselves caught between the Scylla and Charybdis of denial of knowledge-status on the one hand and appropriation on the other. In this paper I suggest that a way out of this bind is to widen the scope of the debate beyond protection and intellectual property rights (IPRs) in the following manner. Firstly, by bringing attention to the concrete work processes that produce this knowledge and secondly by making a case for the inclusion of *lokavidya*-holders in the mainstream education system. The paper is organized as follows. I first review the emergence of the concept of Knowledge Society and the resulting debate over IPRs and *lokavidya*. Next I outline the importance of taking a work-centered perspective on knowledge and discuss the historical and contemporary role of small-scale and artisanal production in creating and sustaining *lokavidya*. I conclude by relating Gandhian ideas on the "unity of head and hand" in education to the issue of *lokavidya* and its relationship with the University.

A. INTRODUCTION

India has recently enjoyed global prominence due to its high profile software sector and its service contribution to the global economy (such as call centers). The National Knowledge Commission has been set up as a "high-level advisory body to the Prime Minister of India with the objective of transforming India into a knowledge society."¹ In this paper I argue that historic

¹ <http://www.knowledgcommission.gov.in/>

transformations in the world of knowledge, which are reflected in the setting up of the Knowledge Commission, have opened the way for a new vision of education in India that is socially inclusive and responsive to India's needs. The majority of Indians who have thus far been shut out of the university system can find a place in it for themselves and their knowledge. In the process, not only can universities become more relevant to Indian society but the hegemony of modern Science over the "commanding heights" of higher education can also be effectively challenged and space can be created for other types of knowledge which have always existed in Indian society.

But for this to occur the limited conception of "Knowledge" that haunts the current discourse on the Knowledge Society must be broadened. To some extent this movement has already begun. A large international literature has emerged on concepts such as "indigenous knowledge," "traditional knowledge," "local knowledge," etc., making the case that the poor and the dispossessed, while they may lack access to tangible resources (such as land, water, and capital), have a rich store of intangible knowledge resources that they can use to sustain themselves under resource-poor conditions (Brokensha, Warren and Werner 1980, Warren, Slikkerveer and Brokensha 1995, Sillitoe, Bikker and Pottier 2002, Finger and Schuler, 2004, World Bank 2004 and Sillitoe 2006).

The idea that society is knowledge-abundant rather than knowledge-scarce may come as no surprise to over 80% of Indians who work in the informal economy and who have routinely relied on knowledge gained outside the formal network of universities and other modern institutions of knowledge production and distribution. Restoring respect for this *lokavidya* and ensuring that its holders benefit from their knowledge are important steps towards creating a poverty-free society (Sahasrabudhey and Sahasrabudhey, 2001). *Lokavidya* is a broader concept than "traditional and indigenous knowledge," and I will use the former in preference to the later when referring to knowledge in society.

The communal nature of *lokavidya* makes it difficult to design effective property rights which might ensure that *lokavidya* producers get due rewards for their knowledge-activity. As *lokavidya* is archived in online databases, dangers of appropriation correspondingly increase and as a protective measure there is a strong push to commoditize this knowledge. A new hierarchy is emerging between knowledge that is organized or represented on the Internet and that which is not. I argue that there is an urgent need to widen the scope of the debate beyond protection or appropriation of "disembodied" forms of *lokavidya* (*lokavidya* as a pool of knowledge in society) to include support of the work processes that *embody* it and that create and sustain this knowledge.

In part, the *lokavidya* commons survives and thrives because of shallow production hierarchies, i.e. little separation between design and implementation, and because of the self-directed, autonomously creative nature of work that often characterizes small-scale and artisanal production. By contrast, deep hierarchies in large-scale industry have traditionally led to a separation of conception/design from execution/ production destroying the producer's *lokavidya* in the process, reducing the artisan to a laborer and further exacerbating the traditional hierarchy between mental and manual labor (Braverman 1974).

Hierarchies of knowledge are thus intimately connected with hierarchies of labor: intellectual labor, manual labor, women's labor and so on. However this link between labor or work, and knowledge is largely missing from the writings on indigenous and traditional knowledge. Relatively little attention has been given to exactly how this knowledge is produced and transmitted, how innovation takes place and what can be done to support the work processes that generate this knowledge. Even less thought has been devoted to how the existing network of universities can be used to restore prestige to *lokavidya* and how inclusion of *lokavidya*-holders in the higher education system can achieve the dual goals of democratizing education and fighting poverty and oppression.

Hence, the debate over "indigenous and traditional knowledge" needs to be extended in two major ways. First, *work* needs to be put back into the discourse on knowledge. Knowledge is produced only in the concrete context of a labor process. And labor hierarchies are causally connected to knowledge hierarchies in ways that I will elaborate later. Second, proposals need to be put forward for transforming the traditional university and the education process itself, by restoring respect to knowledge in society, as opposed to knowledge in the university. Before we go any further, it is important to clarify what type of knowledge we are talking about. The vast bulk of the literature on indigenous and traditional knowledge focuses on biodiversity, natural resource management and herbal medicines. Some attention is also paid to governance institutions, agronomy, and meteorological knowledge. Artisanal knowledge, i.e. dispersed knowledge utilized in small-scale industrial activity (such as knowledge related to manufacture of various articles of necessity and luxury- cloth, utensils, furniture, housing, decorative items, toys, soap, food items, small machinery and so on) is only just finding a place in this literature. Although I will focus on artisanal knowledge my argument is general enough to apply to other types of *lokavidya*.

Lokavidya holders are often deprived of material resources that are needed to apply their knowledge, as with exclusion of local communities from forests and fisheries commons, resulting in impoverishment. In the urban, industrial milieu, failure to recognize the value of *lokavidya* accompanies social exclusion of informal workers and transformation of artisans into laborers. A recent United Nations report estimates, for example, that over the last 30 years number of artisans in India has declined by at least 30% as many skilled workers seek employment as casual wage laborers or in other more vulnerable informal jobs (quoted in Seth 1995).

B. THE KNOWLEDGE SOCIETY AND "FLATTENING" OF KNOWLEDGE HIERARCHIES

Various terms such as "Post-industrial society," "Postmodern Age," "Information Age," "Knowledge Society," "Network Society," "Informational Capitalism," "Cognitive Capitalism" and so on, collectively point to a growing recognition that major economic, cultural, political, epistemic shifts have occurred in the later half of the 20th century (see Fuchs 2008, in particular Ch. 4 for a review of this literature).

The decade of the 1970s was witness to two major developments that set in motion the transition from the "Age of Industry" to the "Age of Knowledge." The first was the demise of the

Keynesian Welfare State which stood for State-managed capitalism, repression of finance, large vertically integrated production with managerial hierarchies and capital-labor compact, and its replacement by the Neoliberal Regime powered by a belief in free-markets, emphasis on profitability at the expense of the interests of the working class, rise of finance capitalism and a transition from centralized, bureaucratic corporations to decentralized, flexible production on a global scale. The second development was a revolution in Information and Communication Technologies (ICTs) which made possible a type of globalization that allowed extraction of surplus value not only via a global trade in commodities but via the construction of value chains that globalized production itself. Just as, in the Industrial Age, agriculture was transformed according to the logic of Industry (mass production, capital intensive techniques, world markets), so also in the Age of Knowledge, Industry is being transformed according to the network logic of informational and knowledge flows.²

At the level of discourse and representation, just as the paradigm of “production” defined the Age of Industry in the first half of the 20th century, so the paradigm of “knowledge management” defines the Age of Knowledge in the second half. And as “Science” was the motive power behind massive increase in productive forces, “Internet” seems to be the driving force of reorganization in the world of knowledge (Sahasrabudhey 2008). In other words, Science, Industry and Production are *no longer the paradigms that define our times*. Their place has been taken by Knowledge and the Internet.

In the new knowledge society, which is said to be emerging in the industrialized countries, majority of those employed are involved in provisioning of services, not in the production of tangible goods. “What counts is not raw muscle power, or energy, but information” (Bell 1973, p. 127).³ Production of information, signals, symbols and images assumes new and greater importance. Knowledge is seen as the principal force of production and increasingly becomes a commodity to be bought and sold in the market. To quote from a recent UNESCO report “Towards Knowledge Societies,” (Binte 2005)

The Knowledge Economy is a particular knowledge-driven stage of capitalist development...succeeding a phase marked by the accumulation of physical capital...wealth created is being measured less on the output of work itself, measurable and quantifiable, and more and more on the general level of science and the progress of technology. (p. 46)

² To take just two examples, by 1992, components of the Ford Escort car were being manufactured and assembled in *fifteen* different countries across three continents (Gereffi *et al* 1994). Nike does not own any shoe factories at all, relying instead on short-term contracts from a diverse array of suppliers. Nike’s contribution is not in the material production domain (say in centralized manufacturing practices) but in the intangible domain of ideas and symbols (i.e. marketing of the Nike logo or brand). These types of global production chains are made possible by the rapid advances in ICTs and in turn the imperatives of accumulation on a global scale fuel new innovation in ICTs.

³ Measured in terms of output, an information or knowledge society is one in which more than 50% of the Gross National Product (GNP) is accounted for by “knowledge sectors” such as Research and Development (R & D), Education, Information Technology, and certain types of services (such as Marketing, Management and Advertising).

The Information or Knowledge based economy is said to rely more on intangible assets such as human capital in the form of education, research and development, and an emphasis on income generated by knowledge products with the help of patents, copyrights, trademarks and so on.

Curiously, the discourse of the brave new world of Knowledge is at the same time too ambitious and not ambitious enough. It is too ambitious because in its celebratory rhetoric it sometimes glosses over the fact that the North-South divide of the Age of Industry is reproduced and reinforced in Information Age as the “digital divide.” One measure of this divide is that only about 11% of the world’s population has access to the internet (though this number is rapidly growing) and 90% of those connected are from industrialized countries (North America- 30%, Europe- 30% and Asia-Pacific- 30%) (Binte 2005).

It is not ambitious enough because the definition of what constitutes “Knowledge” remains severely constrained. Thus Binte (2005) cautions that in India even though the share of the service sector in GDP has risen to 50 percent “75 per cent of the population still lives on agriculture and almost 40 percent is illiterate” (p. 46). In one fell-swoop, all farmers and millions of artisans, women and adivasis who may not be able to read and write, are dismissed from consideration as holders of knowledge or as participants of the “Knowledge Society.” Even in the chapter on “Local and indigenous knowledge, linguistic diversity and knowledge societies” Binte notes,

...when we talk about knowledge societies, what kind of knowledge are we referring to? Are we referring just to scientific and technological knowledge, *mainly the preserve of the industrialized countries?* (p. 147, emphasis added)

Once again, the scientific and technical knowledge that is the preserve of farmers and artisans in countries such as India is completely dismissed in this view. Binte’s assertion that scientific and technological knowledge is “mainly the preserve of the industrialized countries” was the commonly held view during the Industrial Age. Science was defined as the knowledge produced in universities and research institutes created in Europe in the 19th and 20th centuries. Science, thus narrowly defined, was the unquestioned hegemonic system of knowledge and a clear hierarchy was constructed between knowledge that was “scientific” and that which was not. Even Europe’s own numerous artisanal traditions, which were themselves the progenitors of its scientific and technical revolution were no longer deemed scientific. Rather their “craft knowledge” was seen to be in need of being made scientific through formalization and rationalization. The story of how the link between artisans and science was broken and new hierarchies erected for labor and knowledge is very relevant for today’s debates (see Braverman 1974 and Conner 2005 for historical accounts).

Significantly, despite *repeated failures* on part of philosophers of Science in solving the “demarcation problem,”⁴ there was a consensus of sorts that knowledge that was produced at loci other than modern universities, laboratories or modern industry, was either simply superstition or

⁴ The “demarcation problem” in the philosophy of Science refers to the problem of developing adequate criteria for distinguishing Science from non-Science. The logical positivists of the Vienna Circle, and later more famously Sir Karl Popper, wrote extensively on this issue. Later philosophers of Science, in part reacting to the failed attempts on the early 20th century, took a more pragmatic view of the problem and gave up the search for surefire formulas.

more charitably informal, rule-of-thumb knowledge in need to a scientific grounding to make it serious. Philosophical difficulties encountered in marking the boundary between Science and non-Science were deemed inconsequential, particularly by practicing scientists and engineers because the spectacular success of Science was self-evident and proof of the pudding was in eating it. In this atmosphere, Gandhi was one of the few modern thinkers who rejected this hierarchy during its heyday and refused to accord to Science the place of privilege it claimed for itself (Sahasrabudhey 2002).

The hierarchy between scientific and non-scientific knowledge, that went nearly unquestioned in the first half of the 20th century, has since then come under attack. Several factors have come together to ensure this. As awareness of the social and ecological costs of large-scale industrialization and industrial agriculture has grown, as top-down and largely non-participatory models of economic development are questioned, more attention is being given in the Global Academy to what is often referred to as “traditional and indigenous knowledge.” There is a growing interest in knowledge traditions and paradigms all across the world that were previously considered non-legitimate or non-scientific. An implicit, if not explicit intellectual link exists between this new literature and writings from the 1970s and 80s on “alternative science” and “appropriate technology.”

Despite the limitations mentioned above, the discourse of the Knowledge Society has contributed to the flattening of hierarchies between scientific and non-scientific knowledge. In part because the language of Science is now somewhat outdated and the language of Knowledge is ascendant, some room has been created for recognition of other knowledge systems. The rise to visibility of these systems is made more salient by the emergence of the Internet as a global medium for organizing and distributing knowledge, and by a global search for profits from any type of labor process, traditional or modern, based on any type of knowledge. Unlike traditional methods of knowledge distribution such as universities, scholarly journals, and books, the Internet functions in a far more decentralized and “un-policed” manner. The result has been that slowly, but surely, knowledge produced in modern institutions such as universities, laboratories etc., is no longer being viewed as the sole paradigm of knowledge. Or to put it another way, universities and research laboratories, once the exclusive preserve of Science, have begun to acknowledge and interact with other knowledge paradigms.

This is in evidence everywhere as alternative and holistic medicine enjoys a renaissance, peasant knowledge of agro-biodiversity finds new recognition in universities and agricultural colleges, and artisanal crafts enjoy new world markets. The terms indigenous knowledge, traditional knowledge, people’s knowledge, local knowledge and so on are all attempts to define knowledge in society that is not produced within the paradigm of modern science but which has been lifted into global visibility, flattening the traditional knowledge hierarchies in the process.

C. LOKAVIDYA AND INTELLECTUAL PROPERTY RIGHTS (IPRS)

We have seen so far that unlike during the Industrial Age, *lokavidya* has found recognition in the Knowledge Age. However, this recognition is contingent on economic value and economic exploitation. Finger and Schuler (2004) note:

To the extent that the international community has paid attention to knowledge in developing countries, it has focused on two issues:

- The defense of “traditional knowledge” against misappropriation by industrial country interests.
- The policing of “biopiracy” on the part of industrial country interests, that is, exploitation of the biodiversity that exists in developing countries to develop agricultural products, healthcare products, and so forth, without proper compensation to the “traditional communities” that first discovered the usefulness of such genetic material.

The legal system of patents, copyrights, trademarks and intellectual property rights (IPR) regimes in general is key to ensuring that knowledge can be traded in the market as a commodity. However, commoditizing knowledge is difficult due to its non-rival nature.⁵ Since knowledge grows rather than becoming scarce by distributing it, there has been significant resistance to making knowledge artificially scarce via private property rights and recent scholarship has explored the possibility of a Knowledge Commons (Hess and Ostrom 2007). The problems inherent in commoditizing knowledge are further compounded in the case of *lokavidya*. A key distinguishing feature between *lokavidya* and knowledge produced in the formal sector is that a given type of *lokavidya* is often “owned” and practiced by a community of producers that has no legal status that might allow private property rights to be accorded to it. On the other hand, *lokavidya* is, by and large, subaltern knowledge, or knowledge possessed by the disadvantaged, marginalized sections of society. Hence, a vigorous debate has raged over the protection of *lokavidya* from appropriation and over the development of effective intellectual property rights. To this end traditional knowledge online databases are being created to make information on prior art more easily accessible to patent-granting agencies which in turn would prevent the granting of illegitimate patents.⁶

However some commentators have also noted that as *lokavidya* is archived in online databases, dangers of appropriation, rather than decreasing, may even increase since this knowledge is now more easily available. As a response, in addition to cataloging and documentation, there is a strong push to develop IPRs specific to *lokavidya* as a protective measure. A new hierarchy is emerging between knowledge that is organized or represented on the Internet and that which is not. As representation on the Internet becomes the new legitimizing criterion for knowledge, the proponents of *lokavidya* find themselves caught between the *Scylla* and *Charybdis* of denial of knowledge-status on the one hand and appropriation on the other.

The double-edged nature of IPRs becomes obvious when the rhetoric surrounding the knowledge commons is examined. Note that “piracy” is the name given to sharing music, movies and other creative products electronically, in violation of copyright. In this instance the term is used to imply that those who assert the non-rival nature of knowledge by “freeing” it are thieves. In this

⁵ Non-rivalry means that the use of the commodity by one person does not preclude simultaneous use by another. Thus unlike a shirt or a computer, a design, a blueprint, a way of doing things, can be used by many people at once. This non-rival nature of Knowledge has been appreciated for centuries.

⁶ See Finger and Schuler (2005) for several approaches to the problem of developing IPRs for *lokavidya* and Basole (2006) for a discussion of virtual representations of *lokavidya*. Also, recently some experiments have been undertaken in creating a common property rights regime for traditional knowledge in Kerala (<http://www.hindu.com/2008/06/28/stories/2008062856600100.htm>).

case the corporate sector usually labels individuals and file-sharing communities “pirates.” Conversely “biopiracy” (Shiva 1997) is a commonly used term that implies that corporations which bio-prospect genetic resources and traditional knowledge are engaging in thievery. This time the corporations finds themselves accused of the same crime of which they accuse FOSS proponents and other internet file-sharers. This is more than mere irony. Rather, it illustrates how IPRs can be used selectively for protection or appropriation as suits powerful commercial interests.

The issue of effective property rights has attracted immense attention largely because of its economic significance. According to a UN estimate developing countries lose US\$5 billion annually in the form of unpaid royalties to multinational corporations that appropriate traditional knowledge (McLeod cited in Visser 2004).

Ten Kate and Laird (2004) note:

Annual global markets for products in the healthcare, agriculture, horticulture, and biotechnology sectors derived from genetic resources lie between US\$500 billion and US\$800 billion...Direct links can still be made between many products on the market and knowledge systems dating back millennia. For example, of the approximately 120 pharmaceutical products derived from plants in 1985, 75 percent were discovered through the study of their traditional medical use.

An incremental advance over *lokavidya* can thus generate windfall profits with the help of patenting regimes. And going further, in some instances *lokavidya* holders may even be denied the right to use their own knowledge under formal patent laws although thankfully this has occurred only in very few instances thus far.

The above scenario calls for some hard thinking on ways and means to protect *lokavidya* from such appropriation. However, *lokavidya* by its nature is dispersed and difficult to trace to a single source. How can it be patented or copyrighted? More fundamentally, should it be? What other ways exist besides modern IPR regimes to give *lokavidya* its due recognition and make sure *lokavidya*-holders are rewarded for their efforts? I would like to suggest here that while the debate over protection of *lokavidya* is important, it should not define the entirety of the conversation. Rather we should identify and support work processes that embody *lokavidya*.

The importance of this in-situ approach has been discussed in the literature on crop genetic diversity by Brush (2000). Brush points out that ex-situ preservation of seed varieties (products of *lokavidya*) in seed-banks can only be one part of the solution at best. The other part is to ensure that small farmers who actually produce this seed diversity are supported and rewarded for their efforts. Generalizing the argument beyond biodiversity, we may assert that the *lokavidya* commons survives and thrives because of shallow production hierarchies, i.e. little separation between design and implementation and the self-directed nature of work that often characterizes small-scale and artisanal production. By contrast, deep hierarchies in large-scale industry have traditionally led to a separation of conception/design from execution/ production destroying the producer's *lokavidya* in the process, reducing the artisan to a laborer and further exacerbating the traditional hierarchy between mental and manual labor (Braverman 1974,

Marglin 1990). A new hierarchy is created between the knowledge of the manager and designer on the one hand, and the knowledge of the worker, on the other.

In the remainder of the paper, I elaborate on two other dimensions: first, recognition and support of the concrete work practices that produce *lokavidya* and second, the need for building institutional mechanisms for *lokavidya* holders to inform knowledge production and transmission in formal institutions such as universities.

D. WORK AND KNOWLEDGE

Over 90% of India's working population, in its informal economy, fulfills its needs and the needs of society largely without reliance on formal education. The knowledge that these farmers, artisans, women, *adivasis*, and small retailers possess is found abundantly in society. However, it is not seen as knowledge. Low wages, harsh exploitation and unsafe working conditions often characterize this sector of the economy. Job security, unemployment insurance, health and retirement facilities are unheard of luxuries.⁷ It is the main argument of this paper that restoring respect for *lokavidya*, ensuring that its holders benefit from their knowledge, and integrating it into the education system, are important steps towards changing these oppressive circumstances and creating a poverty-free society.

Post-colonial economic development in countries such as India was supposed to be a story of the gradual replacement of the "traditional economy" by the more productive modern, capitalist sector (see Lewis 1954 for one such influential model). The economy of artisans, women, small farmers, indigenous peoples, and small retail, which accounts for almost 90% of the working population, ("informal economy," ILO 1972) was destined for disappearance. In knowledge terms, this can be seen as a replacement of an economy based on *lokavidya* to one based on organized/ formal ("modern") knowledge. Classical development theory developed in the 1940s and 1950s was grounded in a model of *knowledge scarcity*. India and other developing countries were seen to be knowledge-poor and in need of first importing modern knowledge (embodied in imported technology and machinery) and then developing a program for "import-substitution" and investing in its own modern knowledge production industry. Newly set up universities and research institutes, and the knowledge they produced were seen to be independent of the wealth of knowledge that existed among the people. This knowledge of the people was largely ignored if not denigrated.

But in India, the organized sector has so far failed to grow rapidly enough and even today formal manufacturing accounts for less than 25% of manufacturing employment (Saha *et al*, 2004). The informal economy has not disappeared. By some measures it has even grown in size (Jhabvala *et al* 2003, Govt. of India 2007, Harris-White and Sinha 2007). Even now, although economists have come to terms with the existence of this informal economy and its importance in supporting livelihoods, they typically overlook the large and dynamic pool of knowledge that is created and sustained within it. This knowledge not only helps to sustain hundreds of millions of livelihoods, but it also confers benefits to people outside the informal economy as evidenced by the data cited

⁷ See Breman (1996) and De Neve (2005) for two ethnographic accounts of informal labor.

earlier on use of traditional remedies by the organized pharmaceutical industry or of seed varieties by the biotechnology industry.

Lokavidya is not simply “traditional knowledge.” For example, knowledge possessed by communities of artisans who work with wood, clay, iron, plastic, and many other raw materials to produce articles of daily use, utensils, clothes, food items, toys, soap, even small machine parts and repairing and servicing of larger machines, is dynamic and changes in accordance with raw material availability, market forces, technical progress and so on. This knowledge is both *traditional*, in the sense of tracing lineage to pre-colonial periods *and modern* since it has continued to adapt to newer circumstances (Gupta 2000, Haynes 1996, 2001). Furthermore it is dynamic as it constantly adapts to changing circumstance. *The lokavidya perspective recognizes that ordinary life is a center of knowledge production* and not merely an “implementer” of knowledge generated elsewhere.

The concepts of traditional and indigenous knowledge have performed an important role in raising *lokavidya* into international visibility. However, to go beyond simple recognition and to provide an argument for the inclusion of *lokavidya* and *lokavidya*-holders in the coming transformation of the University in the new Knowledge Society, we need to clarify some analytical issues. Firstly, the terms traditional or indigenous, despite the author’s intentions, conjure up a timeline along which societies possessing traditional knowledge are transformed into those possessing scientific knowledge. Further “traditional knowledge” generates a static picture that goes against the inherently dynamic character of knowledge. Tradition is useless if it is not capable of changing in order to meet today’s challenges. *Lokavidya*, in contrast with traditional knowledge, constantly evolves, adapts and changes. It does not seek to tie people to ways of knowing and doing of the past *for its own sake*. It does not romanticize the past or the future. *The sole criterion is the use and control (production and management) of the knowledge by the people in the course of their ordinary life.*

Work as opposed to alienated wage-labor is an integral component of ordinary life and is the foundation of knowledge. Through *lokavidya* we grasp the fundamental relation between knowledge and work. The classical economists such as Adam Smith and Karl Marx understood the importance of work in shaping human character and the development on the human psyche. Unfortunately modern economics has jettisoned this comprehensive view in exchange for a much reduced concept of work as a *necessary evil*, something that confers disutility but which must be done in order to earn a livelihood. It is easy to see why this is the case. In an advanced industrial capitalist economy, the predominant form of work is alienated wage labor. Not only that, most work has undergone a deep *technical* division of labor over the last hundred and fifty years.⁸

⁸ As Marx (1867/1976) and Braverman (1974) describe, with the real as opposed to formal subsumption of the labor process to the needs of capital, there arose a new type of division of labor. Not the division associated with traditional crafts such as carpentry, medicine, metal-work and so on, but rather the parcellation of a complex job into simpler parts and the delegation of these simpler parts to different people, such that one person might perform only a very simple repetitive task all day. One powerful motivation for breaking down a complex task into simpler parts is that workers can be hired precisely according to the skill-levels required by the various parts. If instead all the parts were combined to be executed by one person, that person would have to possess the skill required to finish the most difficult of the jobs.

Bureaucratic managerial hierarchies, rationalized supervision and control are the norm. Under such circumstances work quickly loses its broader meaning and becomes a routine chore.

By contrast artisanal production (whether in agriculture or industry), even under harshly exploitative conditions, often retains a more holistic meaning of work. This is particularly true if the labor process is self-directed and tied to the identity of the artisan. What consequence does this have for knowledge production? The nature of knowledge production in artisanal and small producer communities has not been investigated adequately. Could what has been called “peer production” in the context of the Free and Open Source Software (FOSS) Movement be a useful model for production of *lokavidya* as well?

Peer-production allows a more democratic production of knowledge within the knowledge community (however defined) rather than the one-way traffic between experts/managers and workers/implementers or consumers that we are used to in traditional hierarchical production. In other words the *lokavidya* commons may survive and thrive because of *shallow production hierarchies*, i.e. little separation between design and implementation that exist in small-scale production. By contrast, deep hierarchies in large capitalist firms have traditionally led to a separation of conception from execution destroying the producer’s *lokavidya* in the process, and reducing the artisan to a laborer. The organic link between farmers/artisans and science was broken during the 19th and 20th centuries partly due to professionalization of Science and partly due to the rise of the factory system in place of the craft-based system of production. There exists an extensive literature on how the labor process, within which knowledge is both created and applied, is controlled in the industrial capitalist framework.

The father of “Scientific Management,” F.W. Taylor, recognized clearly that his methods and techniques were as much about maximizing labor productivity, as about gaining control of the labor process by removing its self-directed nature and the *lokavidya*-basis of production. Taylor takes it as given that workers possess knowledge, detailed and intimate knowledge about their work. In his words

...the managers recognize frankly that the...workmen, included in the twenty or thirty trades, who are under them, possess this mass of traditional knowledge, a large part of which is not in the possession of management. (Taylor 1911/1998, p. 32)

Thus in a Taylorist enterprise,

“The managers assume...the burden of gathering together all of the traditional knowledge which in the past has been possessed by workmen and then of classifying, tabulating, and reducing this knowledge to rules, laws and formulae...” (p. 36)

This is the core principle that entails a *separation of conception from execution*. The producer is no longer capable of a self-directed labor process in which she retains a vision of the entire product and is “able to conceive of the totality of his activity as part of another totality.” (Sahasrabudhey 2001) ⁹

⁹ At this juncture one may object that the division of mental and manual labor and the hierarchy between the two is hardly a modern phenomenon. The Brahmin’s knowledge has been considered superior to the chamar’s for many thousand years. The low status of the artisanal

This has far reaching consequences not only in the organization of labor and the deskilling of the artisan, but also in the way new knowledge is produced. Braverman (1974) puts it thus:

“As craftsmanship is destroyed or increasingly emptied of its traditional content, the remaining ties, already tenuous and weakened, between the working population and science are more or less completely broken. This connection was, in the past, made chiefly through the craftsman or artisan section of the working class...” (p. 131)

The ancient relationship between artisanal production and the development of science and technology continued down to the immediate pre-industrial period in England, where such iconic figures of the industrial revolution as James Watt and George Stephenson were craftsmen-turned-inventors. Further the craftsmen were intimately tied to the scientific and technical knowledge of their time as embodied in the daily practices of their craft.¹⁰ And even today in India, the multitude of artisans are possessors of scientific and technical knowledge relevant to their work.

The organic connection between production of articles of necessity and innovation, though far broken in the advanced industrial countries, having been substituted by a professional innovative class (R and D), still remains to some extent in India. As was noted before, artisans have not been completely replaced by the factory worker in the Indian case. Gandhi’s insistence of craft-based production by the masses (as opposed to capital-intensive mass production) can be seen in this context as not only a response to mass unemployment, but rather an attempt to *preserve the link between the masses and science*. Patnaik (2000) recognizes Gandhi’s fundamental grasp of this issue:

For Gandhi and for Lohia, the mode of industrialization is a central and fundamental factor in carrying out civilizational change and this means making new inventions. Unfortunately, the culture of invention/research has changed completely. Now the invention of useful machines has become the provenance of the State or of big business. (p. 94, translated from Hindi)

While conditions may still permit the re-forging of a link between the producing classes and Science, as Gandhi and Lohia wished for, the self-directed and autonomously creative nature of the artisanal production process is threatened in new ways under globalization. Loss of control over factor and product markets and insertion into extensive sub-contracting arrangements are widespread. To an extent lack of access to finance and lack of knowledge of markets has always

castes in general is ample testament of this fact. Philosophers and mathematicians were always distinct from artisans and manual workers. This view is only partly correct. Much evidence now exists from historians of science that the earliest philosophy and mathematics were the product of artisans, of manual workers, and grew in intimate connection with the solving of practical problems, rather than divorced from them. (e.g. Farrington 1947, Chattopadhyay 1986, Conner 2005).

¹⁰ Braverman (1974) notes that craft apprenticeship “commonly included training in mathematics, including algebra, geometry, and trigonometry, in the properties and provenance of the materials common to the craft, in the physical sciences and in mechanical drawing.” (pp. 133) See Conner (2005) for such a peasant and artisan driven “people’s history of science.”

bedeviled the artisan but today she finds herself embedded in extensive middlemen networks and global commodity chains. This produces a new variety of Taylorism that undermines control over design, not by constructing deep managerial hierarchies in a factory setting, but rather by ensuring coordination and control over dispersed and decentralized production processes via Information and Communications Technologies. For the employer, this “neo-Taylorism” reaps the advantages of reduced managerial and overhead costs while retaining control of the production process and achieving a fragmented labor process as well as dispersed, difficult to organize, labor. This increases exploitation of artisanal *lokavidya* and undermines conditions under which it can flourish. It is thus necessary to restore to the artisan her self-direction and control over the various aspects of production. The work of Vidya Ashram in this regard assumes a vital importance, not only as a popularizer of the *lokavidya* perspective, but also as an organizer of artisan labor with the specific demands of access to the market, access to raw materials, and control over finance (Sahasrabudhey 2001, Maurya 2001).

E. LOKAVIDYA AND THE UNIVERSITY

A farmer has never gone to agricultural college where an agricultural scientist works. Both have knowledge but the knowledge of both is valued differently by society and by the market. These two will never compete directly for the same job (can the farmer be a visiting professor at our hypothetical university?). The scientist produces knowledge in the form of scholarly publications. The farmer produces knowledge in the activity of growing his crop. The veracity of the scientist's knowledge is tested by peer-review and replication in the laboratory or field. The veracity of the farmer's knowledge is tested by nature's "review" and replication in life. In response to a mistake, the scientist retracts his research paper/finding, in response to a mistake a farmer may lose a significant proportion of his income and go into lifelong debt. Further the farmer's knowledge activity feeds us. Yet we value his knowledge less.

When we think about the characteristics of a new university appropriate to the Information/Knowledge Age, we should think about how it will incorporate different types of knowledge. As we have seen, in India, a very large part of knowledge production and transmission, particularly of the kind that is directly relevant to sustaining livelihoods, takes place outside the university. A university would be required to be conscious of the multiple locations of knowledge production in society, be they with farmers, artisans, women, indigenous peoples. Such a university would be founded on a holistic view of the relationship between work and knowledge and would consciously challenge the hierarchy between “intellectual” and “manual” labor. It will recognize that all work is "knowledge work."

Gandhi's much discussed concept of *Nai talim* was, of course, precisely one such attempt and it deserves to be reinterpreted and extended for contemporary times. *Nai talim* insisted on transcending the dichotomy between head and hand, between mental and manual labor that plagues education systems all over the world and in the process it merged the world of work with the world of knowledge. According to Gandhi the brain must be educated via the hand. Only then will knowledge production be consistent with the demands of social justice. We must also distinguish *Nai talim* from vocational education. Gandhi himself is clear on this distinction: “The

core of my suggestion is that handicrafts are to be taught, not merely for productive works, but for developing the intellect of the pupils.” (Gandhi 1962, p. 82)

Gandhi sees the purpose of *Nai talim* to be two fold. First, to relieve the toiling masses of relentless and poorly paid work, which is a result of the denigration of their knowledge and denial of access to resources; and second to make the existing schools and colleges relevant to rest of society by producing individuals who are not derisive of manual work. It is heartening to note that the National Focus Group on “Work and Education” chaired by Prof Anil Sadgopal as part of the National Curricular Framework 2005 has taken this issue on squarely:

The exclusionary character of the education system in India is to a great extent founded on the artificially instituted dichotomy between work and knowledge (also reflected in the widening gap between school and society). Those who work with their hands and produce wealth are denied access to formal education while those who have access to formal education not only denigrate productive manual work but also lack the necessary skills for the same.¹¹

The authors of the report contend “that the exclusionary character of Indian education can at least be partly challenged by utilizing the knowledge base of the vast productive sections of society as a powerful means to transform the education system.” (p. iii)

This is precisely the goal of bringing *lokavidya* into the university curriculum. Although both *Nai talim* and the NCERT report are primarily concerned with reform of the basic education system, the argument applies with modifications to the higher education system as well. The works of Vidya Ashram, as well as my own arguments presented here, seek to establish that it is time the prevalent hierarchies of knowledge in society were challenged and dismantled. The universities can be allies in this process rather than being adversaries and can become relevant to the majority of Indians if this is achieved. In some ways, the international discourse on the Knowledge Society has made this task easier.

Unlike the present-day Indian University which is modeled on the nineteenth century European University, the “New University” will not be the supreme source of knowledge, nor even just another site of knowledge production, but rather a process of dialog and cooperation among *multiple sites of knowledge production* (Basole 2008). It will value *lokavidya* and the labor involved in producing this knowledge on par with formal knowledge. Furthermore, it will view knowledge as a means of resistance and reconstruction (*sangharsh aur nirman*). The inclusion of artisanal *vidya* in the university engineering curricula does not only carry the promise of finding a place for these producers in the education system, thereby making it relevant to their needs, but

¹¹ The report continues: “The socio-economic, religio-cultural, gender and disability-related dimensions of this dichotomy have serious implications for education in India. Over a period of time and through systematic practice, such a notion of education has come to be embedded in the knowledge system, representing the dominant classes/castes/cultures/languages with patriarchy in each of these categories playing a decisive role. The education system has tended to ‘certify’ this form of knowledge as being the only ‘valid’ form. In the process, the knowledge inherent among the vast productive forces along with the related values and skills has been excluded from the school curriculum. The legacy of colonial education was built upon precisely such a Brahminical concept of ‘certified’ or ‘valid’ knowledge that is alienated from productive work and its social ethos.” Sadgopal *et al* (2007), p. iii

it also carries the potential to change the epistemic assumptions regarding superior and inferior knowledge that is so deep-seated in our society.

A concrete proposal on restructuring the university is outside the scope of the present paper and forms the ongoing work of Vidya Ashram (see for e.g. Vidya Ashram 2008). At least two objections however can be foreseen straightaway. These are summarized well by the NCERT report on Work and Education:

In view of their historical experience, the deprived sections (especially, dalits, tribals, religious and linguistic minorities) would understandably tend to look upon such a proposal as yet another strategy to deny them access to ‘certified’ and ‘valid’ knowledge, and, therefore, to vertical mobility, a just share in the economic cake and equitable participation in political power. On the other hand, the elite consensus on the education system may counter by labeling this as a ‘conspiracy’ to freeze the nation in pre-modern times and prevent her from becoming ‘an economic superpower by 2020’, the ongoing debate on such myopic notions of India notwithstanding (Sadgopal *et al*, 2007, p. 64)

No doubt other challenges will present themselves. However, *lokavidya*-proponents would be remiss in not availing of the historic opportunity created by the new fluxes in the world of knowledge that were discussed earlier.

F. CONCLUSION

In this paper I have argued that the emergence of the Knowledge Society has created a historic opportunity by raising into visibility the knowledge possessed by the ordinary working poor across the world. However much of this attention has taken the form of a debate over the importance of IPRs in protecting people’s knowledge from appropriation, or of strong property rights for ensuring that the knowledge-holders benefit economically from their knowledge activity.

I have made a case that more attention should be focused on identifying and supporting the work processes that generate this knowledge. Artisans and other small producers across the world are struggling under the impact of neoliberal economic policy. While some have benefited from exposure to international markets, many more are suffering from destruction of local market due to competition, shortage of finance or usurious finance, lack of access to raw materials due to enclosure of the commons and so on. The denial of knowledge-status to *lokavidya* typically translates into an inability of *lokavidya*-holders to gain access to resources on which to apply their knowledge.

This can be remedied, in part, by including *lokavidya* and *lokavidya*-holders in the University curriculum. This will achieve the dual objectives of making the higher education system relevant to the mainstream and restoring prestige to *lokavidya*. The challenge ahead is to make this theoretical vision a reality. The present conference is an important step in this regard.

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