

VOCATIONALISM FOR SOCIAL AND ENVIRONMENTAL RESPONSIBILITY

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SUMMARY

This article argues for a new form of vocationalism at the secondary level that employs principles of social and environmental awareness to improve human communities and ecosystems. The article first distances itself from the conventional practice of vocational education by focusing on two lesser-known critiques of vocational education: critical pedagogy and ecological economics. By looking at the process and outcome of production, the article then questions the virtual acceptance that conventional vocational programs display towards unequal power relations in the workplace and the disregard that current forms of economic production have towards the environment. It then presents a list of social and ecological principles to guide vocational theory and practice. Finally, the article discusses a public secondary school in Colombia that emphasizes socio-ecological responsibility through a form of vocationalism known as School-Based Enterprises.

Introduction

Most vocational education research in secondary schools in developing countries has concentrated on ascertaining its purported economic benefits. While most of this research has deplored the economic returns of vocational education (World Bank, 1995; World Bank, 1991; Foster, 1987; Psacharopoulos, 1987; Psacharopoulos and Loxley, 1985), more recent studies have re-analyzed the data and arrived at quite different conclusions (Benell and Segerstrom, 1998; Benell 1996), and still others have shown that, under certain conditions, vocational education can yield satisfactory economic returns (e.g., Lee, 1998). These conditions include close links between the institution and employers, a terminal degree program, an institution that is autonomous and decentralized, and instructors that also work in the private industry. This debate is far from over and new programs that address the more glaring deficiencies of conventional vocational programs may demonstrate adequate economic returns.

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As important as this economic debate is, the narrow focus on rates of return and economic efficiency has displaced other important, yet marginalized, critiques of vocational education. A serious consideration of these critiques is needed if educators are ever to revamp successfully current technical and vocational programs in ways that help the individual in the context of community welfare. This article dwells on two less known and complementary critiques of conventional vocational education—critical pedagogy and ecological economics—and defends a new brand of vocationalism, one that places the well-being of the student, community, and ecosystem at the center. Empirical evidence is provided from a public secondary school in Colombia that created school-based enterprises (SBEs) with a social and ecological orientation.

The purpose of this article is to make the case that first, an analysis of the ‘black box’ of vocational education (what is produced and how) can push forward students’ comprehension of the symbiotic relationship between human communities and ecosystems; second, that despite the shortcomings of conventional vocational education, productive learning ought to have a vital place in secondary education; and third, that we must highlight alternative forms of vocationalism that are yielding positive results in the realm of social and ecological awareness.

Alternative Critiques of Vocational Education

Beyond the discussion on the economic returns to investment in education, the two aforementioned marginalized critiques look at the process, outcome and purpose of school and work. Critical Pedagogy analyzes the unequal relationships of power characteristic of most schools and workplaces, and the persistence of different forms of social and economic injustice. Ecological Economics, while not offering a direct critique of vocational education, offers the epistemological and methodological tools to revamp the economic system along a perspective of social and ecological sustainability, with obvious implications for vocational purposes and practices.

Critical Pedagogy

As Gregson (1997; 1996), Kincheloe (1995), Corson (1991), Simon *et al.* (1991), Shor (1988), and other critical pedagogues have argued, vocational education is too often used to perpetuate patterns of exploitation in society by both action and omission. Action, by training working class students to acquire low-level skills for low-pay, low-status jobs. Omission, by being silent about societal pathologies that reproduce unequal distribution of wealth, racist and sexist practices in the workplace, and dull and degrading forms of work. A culture of acquiescence is fostered when students are not provided with the necessary critical thinking skills to understand and address social and economic injustices that are an integral part of the economic system.

Vocational education is shrouded by a technocratic approach that trains students to follow orders, obey rules, memorize information, and be passive recipients of knowledge. This pedagogy, variously called “banking,” skills and drills, and teacher-centered, is more concerned with supporting the status quo than with adopting a critical stand. As Kincheloe (1995, p. 25) wrote regarding the role of

practitioners of vocational education, they have been far more concerned with teaching techniques, leadership strategies, public relations, and program evaluation than with the realities of industrial practice, economic theory and its social, political and educational effects, and the nature of dignified work.

Conflict and alternative paradigms are some of the least discussed topics in the vocational curriculum. As Apple (1990, p. 99) stated, conflict is a legitimate sociological category that should be examined carefully in order to learn to live well in pluralistic, multicultural societies. By being timorous about it, vocational courses fail to recognize the political character of education. If students are made critically aware of conflict, and learn to channel it constructively, they would have a more sophisticated understanding of the institutions that permeate their lives. With a knowledge of past and present alternative social and economic paradigms, they may even be able to attempt to restructure these same institutions.

In the hype surrounding the so-called 'knowledge-based' or 'global' economy, vocationalism has been put under the spotlight. Particularly in highly industrialized countries, social, economic, and technological changes influence educators and employers to rethink the connections between school and work. Among the changes being advocated are more teamwork, more access to learning opportunities, greater participation in decision-making, greater variety of tasks, and in general, a more open environment of student-worker collaborative input. Defenders of the new economy argue that advanced technologies are creating a surplus of jobs that are high-skill and high-paid; jobs that replace close managerial supervision with cooperative; and democratic input from the part of workers. Critics argue that this optimistic view is not supported by hard data. According to Edwards (1996: 19), "in workplaces where technology is advancing most rapidly, skilled manual tasks tend to be disintegrated into increasingly routine, repetitive operations" that require no creativity or problem-solving work. Edwards also analyzed occupational growth patterns, and concluded that the greatest absolute growth in employment is seen in the low-skill service sector (e.g., janitors and food servers). Meanwhile, these changes take place in an economic context characterized by an increasing gap between rich and poor, a larger number of displaced workers who take on part-time and contingent work, and a growing uncertainty regarding a worker's economic future (Spring 1998; Rifkin 1996).

As important as it is to eliminate unjust forms of social and economic stratification, that is not enough. One could conceivably find a firm in which the highest paid employee earns just a few times more than the lowest paid, there is a large degree of democratic participation, and there is an adequate and fair system of protecting the rights of workers. It is also conceivable that this same company manufactures a destructive, dangerous, or deceptive product (or service) that the capitalist system treats as value-neutral. The product's worth is determined by its market value, not by its value to community and ecological well-being. Challenging the supposed 'neutrality' of the capitalist system thus becomes an urgent task. For this reason, I shall extend the discussion of vocational education to include the outcome of the productive process, which is as important as the process itself.

While Ecological Economics (EE) does not address directly the field of vocational education, its lessons can be applied to restructuring vocationalism. EE is a multi-disciplinary field that views the economy as a subset of the larger global ecosystem (Costanza *et al.*, 1997; Costanza, 1991; Daly and Cobb, 1989). While ‘conventional’ or ‘growth’ economics (e.g., capitalism and communism) treats the economy and the environment as independent entities, EE treats them as completely enmeshed and interdependent. One of the main differences between them is related to the concept of scale—the physical volume that is extracted from and deposited back into the planet (Costanza *et al.*, 1997, p. 80). Growth economics extracts natural resources ceaselessly to satisfy unlimited wants; these resources are transformed, used, and then deposited back into the environment as waste, without any regard for the ecosystem, or for how that throughput may affect human communities. In contrast, EE assumes from the start that the global ecosystem is the source of all material inputs that feed the economy and the sink for all its wastes. Consequently, it emphasizes the need to protect and respect the regenerative and assimilative capacities of the Earth. Put differently, while growth economics is comfortable with externalities in the production and consumption process (often minimizing their importance), EE seeks to internalize all externalities.

Perhaps the best way for understanding EE is by contrasting it to growth economics. For the purposes of this article, I will only mention three differences. First, growth economics defends the principle of non-satiation. “Man is an acquisitive animal whose wants cannot be satiated,” wrote economist Lester Thurow.¹ Under growth economics individuals are seen as avid consumers who are constantly in search of cheaper and more resources. Given the material limits of the biosphere, this unlimited acquisitiveness can never be satisfied, and any attempts to do so threaten the life-sustaining properties of ecosystems. Second, growth economics defends competitive individualism. This idea stems partly from the misguided belief that since competition underlies most relationships in nature, so it should in the economic system as well. Such a bias makes competition and struggle seem “natural,” and thus inevitable. However, as biologists have pointed out, evolutionary success is not a matter of winning or losing but rather of adapting. In analyzing the process of natural selection, George Gaylord Simpson wrote, “[Competition] is sometimes involved, but usually is not, and when it is, it may even work against rather than toward natural selection. Advantage in reproduction is usually a peaceful process in which the concept of struggle is really irrelevant.”² Thus, in nature competition exists in a much larger framework of cooperation.³ Third, growth economics sees itself as an objective science, and thus economic theory has no use for ‘values.’ To understand the importance of values, consider the services provided by nature. Nature purifies water, recycles wastes, grows forests, creates soils, cleans the air, and so on. How does growth economics deal with environmental degradation? It assigns a market value to all identifiable externalities, and then applies a cost-benefit analysis. While this strategy is part of the solution, no adequate price can be assigned to the long-term and perhaps irreversible loss of natural habitats of the Amazon forest, or to the spiritual connection

that exists between Amazonian indigenous communities and the surrounding ecosystem.

One of the clearest examples of applying the lessons of ecological economics to vocational education is seen in agricultural vocational schools. Most of these schools teach their students high-input forms of agriculture, which means that students will engage in large-scale, mechanized, energy-intensive, and monocultural forms of production that use excessive amounts of synthetic pesticides and fertilizers. The negative environmental effects of this type of agriculture include biologically impoverished soils, cutting down of forests, soil erosion, and a reduction in the genetic pool of crops. It also teaches students to view nature as a natural resource to be exploited at will. The application of ecological economics would mean the training of students in small-scale, labor intensive, and policultural agricultural techniques. It would mean helping students to rescue traditional forms of cultivation and harvesting, by asking elders in the region about traditional sustainable practices. It would also mean helping students to develop a completely different attitude towards nature, from a utilitarian view to one of respect, care, and even reverence.

Combining Social and Environmental Responsibility

Given these alternative critiques of conventional vocational education—critical pedagogy and ecological economics—I want to put forward a new understanding of vocational education, one whose purpose is pro-human and pro-nature at the same time. The emphasis on *purpose* is essential for re-evaluating the practices of vocational education. The conventional purpose has been to train students to join the workforce upon graduation; it is believed that the skills and know-how acquired in school will translate into greater personal and social returns (as measured by higher income and productivity). It is certainly desirable to assist students to be technically proficient and find high-paying jobs. As this paper has shown, however, this goal has been extremely illusive,⁴ and it has been done at the expense of other important objectives. If we were to recast the purpose of education in a completely different mold, new vocationalism emerges as a vital tool for re-structuring vocational and academic education in general.

The term ‘new vocationalism’ has been used by researchers in a different context. Grubb (1996: 535), for instance, defines “new vocationalism” as “the development of integrated instruction organized around broadly defined occupations—or a combination of occupations, social problems, and other engaging topics” which allows for a heterogeneity in forms of vocational programs. The present article adopts a different view. It specifically supports an emancipatory view in the direction of social and environmental justice for vocational education in particular, and for the whole conception of learning in general. Thus, new vocationalism as presented in this article rests on two definitions of education. The first one, provided by critical pedagogues, asserts that education should address the ways injustice and subjugation shape our world; we must actively challenge current social and economic practices that help a few while exploiting the majority. The second one, provided by the philosopher J. Glenn Gray, asserts that “the educated man...is one who has grasped the simple fact that his self is fully implicated in those beings

around him, human and non-human, and who has learned to care deeply about them” (1968, p. 34). While the emphasis of both definitions is somewhat different—one more political, the other more ecological—taken together they reflect a deep understanding of the interdependency between the social and the natural world. Implicit is the importance of respect and dignity, while avoiding the extreme forms of individualism and collectivism. Ultimately, the singularity of the self emerges from the relationship with others and the environment.

Based on the theoretical understandings of both critical pedagogy and ecological economics, a series of principles can be put forward to revamp the process and the purpose of vocational education. While some of the principles overlap (due to the close interdependence between social and environmental systems), this should not detract educators from attempting to implement both sets of principles.

In terms of social responsibility, vocational education programs should:

- Ensure an equal concern for imparting adequate skills alongside a critical analysis of the social and political history of vocational education.
- Promote horizontality and ample dialogue in the decision-making process regarding the process and purpose of production. Democracy, social justice, and environmental protection should be main goals.
- Ensure that product or service addresses a social or environmental need. Do not create a product that is intended to harm humans or the environment, that has a built-in obsolescence, that is built on false needs, that deceives or manipulates, or that uses resources obtained by exploiting the labor of others.
- Avoid unnecessary job specialization. Allow all students to engage in as many activities of the production process as possible.
- Ensure that students are exposed to alternative forms of economic production (e.g., worker-owned businesses; cooperatives; unions) to promote collective associations, and, if possible, put them in practice.

In terms of environmental responsibility, vocational education programs should:

- Establish meaningful and productive relationships with firms that engage in ‘green’ practices. Encouraged by a system of tax incentives and breaks, other firms may join in.
- Assess needs of locality first, instead of establishing standardized vocational models with pre-packaged answers for a whole country or state. ‘Needs’ should be understood, not in the modern sense of wants that are shaped by industrial commodities, but as the mixture of basic material and non-material needs that promote physical, emotional, and spiritual welfare.
- Strive for usage of local and organically grown resources. It is more economically sensible (lower transportation costs and lower costs associated with externalities), and it also helps to ensure soil fertility, less erosion, more forests, and cleaner air and water.
- Emphasize products that are durable, repairable, refurbishable, and that make use of alternative energy and/or are energy efficient.
- Push for product life-cycle analysis at school to help unveil hidden externalities. While some responsible firms have adopted this strategy, vocational pro-

grams have not. Understanding the full environmental and social impact of a given product or training would enable a school to adopt and restructure its program along sustainable lines.

- Promote the conversion of all waste into a resource. New firms can spring forth that transform waste into useful products. Just as in any mature ecosystem all waste is incorporated into the system and recycled—in fact, the term ‘waste’ is meaningless in an ecosystem because the bodily discharge and decomposition of an organism serve as nutrient for another organism—vocational programs and firms must also seek to convert all waste into resources. This way, the energy and material cycle would make a complete loop.

None of the above is a hard and fast rule. One may find a capital-intensive program that uses synthetic materials imported from afar that is more ecologically sensitive than a labor-intensive program that uses local products. For instance, a teacher of a vocational fishing program decided to use PVC cages for his aquaculture program after he realized that the natural material he was using before, bamboo, found locally for free, was in danger of extinction through indiscriminate cutting. After he decided to import the PVC tubes, the bamboo cutting stopped, thus avoiding unnecessary environmental damage (Arenas 2000: 176). Thus, while the above principles may prove useful in designing a vocational program, they are only a set of guidelines to be used in a flexible and judicious manner.

Case Study: A School-Based Enterprise in Colombia

There is no single correct form of vocational education. The great diversity of histories, cultures, knowledges, and skills from one school to another encourages a *heterogeneity* of programs to better suit the needs of each locality (Grubb, 1996). In this article, I will focus on Student-Based Enterprises (SBEs) as one form of vocational education for enhancing education. SBEs are generally defined as those activities organized by the school in which students produce a good or service that is sold to, or used by, people other than the students (Stern *et al.*, 1994). Without seeking to compete against local merchants, the SBEs’ products and services attempt to respond to the community’s social, environmental, and economic needs.

As a case study, I will present the Fernández Guerra Secondary School (also known as Ferguerra), a public school in Colombia.⁵ Ferguerra is located in the town of Santander de Quilichao in Colombia’s southwestern region. An academic school with a student population of about 700 hundred (afternoon shift), Ferguerra established in the mid-1990s one SBE in each grade level as a means for contributing to the community while fostering entrepreneurialship skills in students. Most of its student population comes from very poor families, and the school itself has few material resources. Given Ferguerra’s high level of social and ecological commitment, the Colombian Ministry of Education considers the school a model program.⁶

Ferguerra Secondary School

Officially, students work in the SBEs for two hours a week in grades 6 to 9 and for three hours a week in grades 10 and 11. In practice, however, students work in the SBEs long hours during weekends and after-school hours. Children in all grades have to contribute a weekly sum to buy materials, which increases as the grade level goes up, ranging from \$0.50 cents to \$1 dollar weekly. Ferguerra selected a core group of four or five teachers to lead the SBEs, all of whom take courses on entrepreneurial skills at a local post-secondary institution. In all SBEs, a democratic process exists through which students can make their voices heard, suggest changes, and address complaints. Moreover, profit is divided in equal percentages between the school, the teacher, and the students. The following are the SBEs currently in place at Ferguerra:

- 6th grade: Paper made from fruit waste.

The process starts with local fruit vendors in the town's main plaza who sell pineapple, bananas, and *lulo* (a local fruit). In the past, after selling the fruit, the skin, stem and part of the pulp would often end up as garbage on the street. Nowadays, thanks to the cajoling of students and the local waste collector, fruit vendors put the rejects in plastic bags that are later picked up by the waste collection company. Every two weeks the students collect the bags from the garbage company and take them to the school compounds. Once there, they make paper, decoration boxes and cards that are then sold to shops locally and in nearby towns.

This business offers numerous benefits: the main plaza remains clean and beautiful; the environmental consciousness among fruit vendors and customers is raised; the fruit waste becomes an economic resource instead of ending up as waste in the town's landfill; and students learn novel ways of producing a basic need such as paper without using any trees.

- 7th grade: Brooms made from wood and synthetic fibers.

The idea originated in a field trip to a nearby addiction rehabilitation center that manufactures different products. The school later contacted the center to ask for technical advice on broom production, and several patients offered to be the instructors. In the local stores one usually finds these same products, but they are of poor quality and not long lasting. To manufacture the brooms, students buy the whisk (made of synthetic fiber) and the wood sticks (bought from a timber company that does not harvest sustainably). Recently, students and teachers stated to discuss the viability of substituting conventional materials for natural and sustainable ones: replacing the synthetic fibers with natural broomcorn fibers and the current sticks with sustainably-grown timber.

Thanks to this business, students develop a meaningful relation with adults who are traversing a difficult process in their lives; teachers and students learn side by side because both are taught by patients at the rehabilitation center; and students start appreciating the difficulty of switching to materials grown sustainably.

- 8th grade: Picture-frames made from solid waste.

Students and teachers go to abandoned construction sites to collect diverse materials, including metal, hardened clay, glass and wood, and make picture-frames out of them. Students express a great deal of enthusiasm in this project given that they create their own designs. In the manufacturing process, students also learn different welding techniques.

As in the tree-free paper business, students learn that there is no such thing as waste, only untapped resources. Unlike the broom production in which students have to make a continuous investment to buy materials, in this SBE raw materials are free.

- 9th grade: Plant pots and bookshelves made from bamboo.

This process differs from the broom SBE in that students and teachers cultivate the bamboo themselves. Teachers contacted a regional environmental organization that offered the school 5000 bamboo starters every year with the condition that, once they grew to an appropriate size, half of the stems would be planted along the bank of the local Quilichao river and the other half would be kept by the school for free. With these 2500 stems, the school is now making plant pots and book shelves. Over time, teachers intend to diversify the production line to include fences and lamps.

This SBE provides multiple benefits: two different institutions join forces to combat erosion; students participate actively in mitigating a local ecological problem; students learn to cultivate bamboo, from the moment of preparing the soil to caring for the plant; and thanks to the rapid growth of bamboo, students can avoid the problems of the broom SBE of relying on companies that produce unsustainably.

- 10th grade: Hydroponics.

Given that the school has no green area, several teachers have complained about the difficulty of teaching agricultural skills—other than those learned by 9th graders. To address this problem, a natural science teacher proposed to start a hydroponics project on an empty flat roof at the school. Over time this project became the SBE for 10th grade. This SBE is in its initial stages and while the production is low, students have already grown tomatoes, cucumbers, peppers, and other vegetables.

This is the only SBE in which students produce something truly basic: food. Students that have gone through this SBE express amazement at learning how to grow their own food, which the school considers one of the most important means for fostering self-sufficient individuals and communities. This skill is especially important because many students live in small houses with cement backyards. Teachers and students are exploring the possibility of using the students' homes to ensure that they continue to cultivate with hydroponics even after moving onto the next grade level.

- 11th grade: T-shirts and Painted Designs.

Of all the SBEs, this was the only one chosen by the students themselves. The business originally consisted of students buying white T-shirts, painting a design of their choice, and selling the shirt. In order to raise money to buy the shirts and paints, students organized raffles and games in the school. After six months of continuous operation, teachers decided to intervene to challenge some of the assumptions embedded in the business. One of the points of contention was the choice of design, Disney World motifs. Teachers prompted students to re-examine the power of mass consumption, and to compare the symbols with local and more meaningful ones that were often denied legitimacy. Another qualm was the usage of synthetic paints instead of a natural alternative. This SBE was an eye-opener because it forced students to re-evaluate their own choices and to contextualize much of what they had learned in their courses. As a result, students suggested using ecological motifs (e.g., painting the Saman tree, the town's main symbol); designs from indigenous groups that inhabit the region (Paeces and Guambianos); or simply the student's own creations. Other students suggested learning from the indigenous groups how to make natural dyes from plants, and it is hoped that over time close contacts between the two will take place.

Some Issues and Problems

Addressing Social Injustice

As part of the SBEs and of the curriculum in general, the school organizes visits to workplaces in the region. During the visits, which may last several days, students observe the production process and interview workers and managers at the company. Some of the questions asked center around working conditions, salaries, labor benefits, and even the meaning of work. With this information they go back to school where they discuss the socio-economic conditions of workers and the nature of economic relations, including the importance of unions, cooperatives, and the like. This analysis does not intend to make students into 'trouble makers,' but into critical individuals who peruse reality from multiple perspectives.

The process and the outcome of the SBEs themselves is also given considerable attention. Teachers try to create conditions that are fair for everyone in terms of cost/profit sharing and workload distribution. Moreover, meetings are held to address inter-personal relationships, production efficiency, and connections between the SBE and the community. While the SBEs are not subjected to the same constraints as those of a 'real' enterprise, the SBEs can still provide some understanding of how a model workplace could function, and how a 'real' workplace could be improved.

Reconciling SBEs with Curriculum

At Ferguerra there is little reconciliation between the two: SBEs constitute a class in themselves with little relationship with other courses. While this practice corresponds to the original academic status of the institution, teachers are in the process of reconciling both. Specifically, SBE teachers attempt to mold the SBE around the thematic curriculum corresponding to its grade level. For example, the

theme for 6th grade is the basin of the local Quilichao River. Historically, the river has suffered from sedimentation caused by deforestation—partly due to industrial processes of paper production. The 6th grade SBE deals head on with this issue by engaging in a form of papermaking that is ecologically benign.

Not all of Ferguerra's SBEs lend themselves so easily to curriculum integration, mostly because the SBEs were chosen according to each teacher's knowledge, and not according to the thematic curriculum. However, given the close-knit community at the school, teachers often restructure their work to match it to the overall goals of the school. In any case, given the school's academic orientation and the enormous amount of energy and time that teachers devote to consolidating the thematic curriculum, it is clear that the SBEs will have to mold themselves around the themes and not the other way around—which may be a perfectly adequate strategy for a mostly vocational school.

Cost Recovery and Efficiency Improvement

One aim of SBEs is to recover partial or total costs of production. This is especially important for poor schools, since defraying production costs helps to ensure the continuation of the program. While the school does not keep systematic records of costs incurred and profits obtained, teachers and students informed me that of the six SBEs half break even and even make some profit (8th, 9th, and 11th), while the other three are in the red (6th, 7th, and 10th). Teachers attribute the difference to a combination of the teachers' interest (teachers from higher grades feel greater pressure to show that their SBEs are economically productive), the stage of development of the SBE (those making profit were started earlier than those in the red), and the acquisition of raw materials (it is easier to make profit when the raw materials are free than when they have to be bought). In the case of the papermaking SBE, although the raw materials are free, the initial capital investment has prevented it from making profit yet.

In general, while Ferguerra wants to improve the economic efficiency of all SBEs it does not want to do it by relinquishing their educational mission. This is aided by the school's academic focus, which takes off pressure to demonstrate positive financial results. As a Ferguerra teacher stated, "We want students to learn. If that means taking longer to produce something or not even making a profit, so be it. But we cannot sacrifice the learning experience for efficiency." Not all Ferguerra teachers shared this opinion. Another teacher said, "While I agree that recovering costs or even making a profit shouldn't be our overriding concern, over time we should make our SBEs look like real enterprises so that students get an inkling of understanding of what a real job looks like, or even better, what it ought to look like."

The conflict between fulfilling educational goals and recovering at least basic costs reflects the contradictory demands on SBEs (similar to the ones encountered by Stern *et al.*, 1994: 148). This quandary is not easily resolved, and SBEs end up walking a fine line between the two. Notice, however, that none of Ferguerra's SBEs are too costly to set up, even for a poor public school. The financing of the SBEs has come mostly from the students themselves, and to a lesser degree from private firms (e.g., environmental group donating bamboo starters) and the school

(e.g., providing materials for hydroponics). This initial low cost and maintenance should help researchers reevaluate common notions about the supposed ‘unavoidable’ high costs of vocational education.

Ensuring a Sustainable Production

This form of vocationalism attempts to broaden simultaneously economic goals (satisfaction of basic needs, keeping costs down and if possible making a profit), social goals (social justice, cultural diversity, meaningful work, institutional responsibility) and ecological goals (ecosystemic diversity, resilience, interdependence). Given their special status as enterprises based in schools with a primary function to enhance education, SBEs can afford to experiment with forms of production that employ sustainable materials and processes. Broom production, for instance, could become sustainable if the necessary alternative materials are found; the T-shirt enterprise could provide a powerful educational experience as long as the discussions on sustainability continue *and* action is taken to replace the designs and possibly even the paints. Even if only the designs are replaced, it would still present an example of a useful compromise: promoting important social and ecological symbols while still using materials that are not necessarily ecologically benign.

Depending on the nature of the product or service provided, some compromises may be inevitable. The T-shirts may have been produced by a firm that has little regard for its employees, or that bought the cotton from another firm that uses carcinogenic pesticides in the fields; or the paints may be so toxic that using them causes environmental damage; or the companies may promote their products as ecologically benign when in fact the truth lies elsewhere. Misinformation and a lack of information constitute important obstacles for adopting correct decisions. Clearly, there are no easy choices and it would not be surprising to find SBEs (or any other enterprise) involved in a mixture of ‘good’ and ‘bad’ practices. After all, an immanent part of modern life is the inevitability of this mixture. What is important, however, is to be cognizant of when a compromise is being made and to determine if such compromise is worth it. In conclusion, there are no absolute guidelines regarding sustainability but rather different levels of sustainability. Students and teachers should discuss these matters fully, and transform their SBEs as much as possible into truly sustainable enterprises from a social and ecological standpoint.

Conclusions

Opponents of vocational education base their resistance on economic efficiency arguments, and not on educational ones. As Foster (1987, p. 138) wrote, “few would contest the *educational* desirability” (italics in original) of vocational education, but many would contest its economic returns, specially in developing countries. As I have tried to show in this article, it is perfectly legitimate and greatly desirable to support vocational education based mostly on educational grounds. The skeptic will ask, where will the money come from to finance these programs? With regard to capital-intensive programs (heavy machinery, computer labs, electronic equipment, etc.), they tend to be expensive to set up and

maintain, seldom yield satisfactory personal or social rates of return, and often go against the goals of sustainability as outlined here. However, when educational planners decide to work with a completely different set of assumptions regarding the purposes of vocational education, they realize that it is possible to set up affordable vocational programs, even for poor schools.

A look at the majority of studies on conventional vocational education attempt to answer the following question: how can schools be restructured to ensure that graduates fit as smoothly as possible into the working operations of businesses and industries? Embedded in this question is the taking for granted of growth economics. These studies are silent about the more questionable aspects of the economic system, and end up supporting its alleged 'moral neutrality.' To be sure, a noble goal belies most of this research: to increase poor children's social mobility and access to higher-paying jobs. But in this attempt, most studies neglect how these jobs contribute to social and ecological deterioration.

Forms of vocationalism such as SBEs will do little to improve the economic lives of graduates. Just as with the conventional form, new vocational schools have no control over the creation or improvement of employment. Nevertheless, the new vocationalism, particularly when fully integrated with the academic curriculum, does offer several advantages. It does away with the passivity typical of many classrooms, brings together manual and mental activities, reduces the intense individualism of schools, and helps students to feel a deep sense of commitment towards their community. Successful examples portrayed by Ferguerra's SBE demonstrates their programs' ability to stimulate students awareness of ecosystems, and the role of citizen's social and ecological responsibility. These programs not only promote respect for one's environment—teaching students about resource management and recycling waste products—but simultaneously expose students to the complexities and benefits of good work ethics, collective efforts and job performance. Finally, SBEs can begin the process of promoting the emergence of self-sufficient communities by teaching students that for many basic things (e.g., paper, picture frames, plant pots, vegetables) they do not have to rely on the market economy, but just on their own hands and ingenuity.

RESUMEN

Este artículo se pronuncia a favor de una nueva forma de educación vocacional a nivel secundario que utiliza principios de conciencia social y ambiental para mejorar las comunidades humanas y los ecosistemas. Al inicio el artículo toma distancia de las prácticas convencionales de la educación vocacional para centrarse en dos críticas menos conocidas de la educación vocacional: la pedagogía crítica y la economía ecológica. Observando el proceso y el resultado de la producción, el artículo cuestiona la aceptación virtual que los programas vocacionales convencionales muestran hacia relaciones de poder desiguales en el lugar de trabajo y la poca atención que las actuales formas de producción económicas tienen hacia el medio ambiente. A continuación, presenta una lista de principios sociales y ecológicos para guiar la teoría vocacional y la práctica. Finalmente, el artículo analiza una escuela

pública secundaria en Colombia que enfatiza la responsabilidad socio-ecológica a través de una forma de educación vocacional conocida como Empresas Escolares de Base.

SOMMAIRE

Cet article plaide pour une nouvelle forme d'enseignement au niveau secondaire qui utilise des principes de conscience sociale et environnementale afin de créer une sensibilisation et une amélioration entre les communautés humaines et les écosystèmes. L'article se démarque lui-même de la pratique conventionnelle de l'éducation professionnelle en se concentrant sur deux critiques moins connues d'éducation professionnelle : pédagogie critique et sciences économiques écologiques. En regardant le processus et les résultats de la production, l'article remet en cause alors l'acceptation virtuelle que les programmes professionnels conventionnels montrent vers des relations inégales de puissance dans le lieu de travail et la négligence que les formes courantes de production économique ont vers l'environnement. Il présente alors une liste de principes sociaux et écologiques à la théorie et à la pratique en matière professionnelle de guide. En conclusion, l'article prend comme cas d'étude une école secondaire publique en Colombie dont le sens de responsabilité socio-écologique est théorisé sous une forme d'enseignement connue sous le nom d'entreprises École-Basées.

RESUMO

Este artigo se pronuncia a favor de uma nova forma de educação vocacional a nível secundário que aplica princípios de consciência social e ambiental para melhorar as comunidades humanas e os ecossistemas. Ao princípio o artigo centra-se em duas críticas menos conhecidas da educação vocacional: a pedagogia crítica e a economia ecológica. Observando o processo e o resultado da produção, o artigo questiona a aceitação virtual que os programas vocacionais convencionais mostram sobre as relações de poder desiguais no lugar de trabalho e a pouca atenção que as atuais formas de produção econômicas tem com relação ao meio ambiente. Logo, apresenta uma lista de princípios sociais e ecológicos para guiar a teoria vocacional e a prática. Finalmente, o artigo analisa uma escola pública de segundo grau na Colômbia que enfatiza a responsabilidade sócio-ecológica através de uma forma de educação vocacional conhecida como Empresas Escolares de Base.

NOTES

1. Mary E. Clark, "Rethinking Ecological and Economic Education: A Gestalt Shift," In Robert Constanza (ed.) *Ecological Economics*. New York: Columbia University Press, 1991: p. 401.

2. Ibid, pp. 403.

3. For a lengthy discussion of cooperation, and not competition, as one of the underlying principles in nature, see Robert Augros and George Stanciu, George, *The New Biology: Discovering the Wisdom in Nature*. Boston and London: Shambala, 1988.

4. The World Bank has even proposed to eliminate vocational education programs from secondary schools and transfer the responsibility of vocational training to private firms (World Bank 1995; World Bank 1991). The World Bank argues its position based on the premise that the social and economic costs of implementing vocational programs far outweigh the benefits. Benefits are measured by rates of unemployment, number of months to find employment, and salaries upon hiring. Vocational programs however offer many benefits that go beyond concerns of economic productivity or efficiency. Vocationalism helps alleviate the lack of relevance, context, and concreteness of academic education; it helps bridge the gap between school and community; it allows students to feel pride in their work; it challenges the individualized nature of schooling by allowing students to learn collectively; and when integrated with academic education, it does away with the artificial and fallacious separation between so-called mental and manual work. For a lengthy exposition of the benefits of vocational education, especially when integrated with academic education, see Grubb 1995; 1996 and Stern *et al.* 1994.

5. This research was based on an ethnographic study the author did at Ferguerra in 1997 and 1998. Finance for this research came from a Fulbright-Hays Dissertation Research Fellowship.

6. Apart from the SBEs, Ferguerra follows a model of social and ecological education in which each grade level concentrates on a different local, national, or international theme. The themes are divided according to geographic scope and complexity, and all academic courses converge around the theme. As the grade level increases so does the scope and complexity of the theme (6th grade focuses on the local river while 11th grade on international issues and their effects on the nation and locality).

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