

Education as the Missing Link in Rural Development: The case of Post-primary Education in Mexico

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This paper is based on an evaluation study of an innovative system of rural education in Mexico, which the authors visited during July, August and September 2000. Based around the freedom of students to study topics of their own interest, or method of studying on one's own account (MAPCP), the Post-Primary education project offers a wide range of opportunities to communities, including the ability to study issues of commercial and social value to the community, and the possibility of adding synergies to other development programmes. This leads to a discussion of the role of education in rural development, and possible future directions and research questions which should be dealt with in the future. In particular, it is suggested that an "education bottleneck" exists in development programmes, and the present project in Mexico offers an opportunity to study the role of education in development more fully.

As educators, one of the perennial problems which we have to face is that some forms of investment are more attractive than others, and the least attractive is normally education. In the modern global economy we see companies spending millions of pounds on computer systems, and little if anything on developing the skills in their staff which will help them use the new technology effectively.

Initially the World Bank did not consider investment in education as being an appropriate concern, although it has long since changed its view on that issue. Even so, the development of human resources runs a poor second to investment in new technologies and new equipment in the minds of most politicians.

In rural development, as in other areas, technology has been seen as taking the necessary lead. New crops, new varieties, new techniques and new fertilisers will lead to the green revolution, and feed the hungry of the world. In agriculture in the developing world, more than in any other area, this approach has been an unmitigated disaster, from the ground nut scheme of East Africa to the present day. In the summer of 2000, while visiting rural Educational Centres in Mexico, we came across the usual range of failures; "We grew potatoes on the advice of the agricultural engineer, but when we had collected the crop, the prices were so low we made next to nothing for them"; "We bought 24 chicks, but they all died, so we bought another 24 and they all died too - they come from a hot place and cannot stand the cold in the mountains"; "We have been growing the same variety of maize for generations, keeping the seed from one year to the next, but we introduced the new variety even though we cannot keep the seed - and we were infested by a new pest which we had never seen before"; "We want to know how to produce organic compost, but do not know how to find out". And perhaps most typical of

all: "We had a crop of water melons, but if we had hired the truck and the labour, it would have cost us more to harvest them than the agents were prepared to pay (which was a sixth of the price in the nearest market) - so we left them in the field to rot".

These were not particularly complaints, and they were certainly not the musings of unsophisticated people; they were the musings of people who understood their own situation, and who understood that they needed to know more if they were to make proper use of the advice they were being offered - generally by specialists who understood the local conditions much less.

The solutions, in general terms, were as clear as the problems, and equally well understood by the people we met. What they were looking for were ways of giving "added value" to the products of their labour. Could they find a way of saving their crop, so that they did not have to sell at the lowest prices? Could they turn their product into something else more valuable? Could they cheaply reduce their losses, by controlling pests or recycling waste products? But answering these questions in any specific case would require access to specialist knowledge, and it was not clear who would have that.

At one level, the Post-primary Project in Mexico is an attempt to provide an answer to these questions, by putting Educational Centres in tiny rural communities, as a resource to help people find answers to the questions which really concern them.

The Post-primary Project

In 1997 CONAFE (Consejo Nacional de Fomento Educativo / The National Council for Educational Development) in Mexico, with support from the World Bank, established a Post-primary Project, with 53

Educational Centres in 8 States. By the summer of 2000, the project had grown to 235 Centres in 21 States. In July 2000, we were invited by CONAFE to make an evaluation of the project. As part of the evaluation process, we read documents which are produced regularly by members of the Project Team, the results of an internal review of the Project, and visited Centres in the States of Mexico and Veracruz.

The term "Post-primary" needs some explanation, since it should not be taken to mean "Secondary". The objective was to establish Educational Centres in rural communities with a population of less than 500 inhabitants. These centres have resources which include a library of several hundred books, and usually a video recorder and library of video tapes, and a computer and library of compact discs. (The fact that many of these communities do not have an electricity supply means that it is not always possible to have electrical equipment, although with the use of solar plants the project is overcoming even this difficulty.)

The intention is that any member of the community should be able to use the centre to study their own interests. Based upon a system of individualised learning, learners can come to the Centre, identify their own topic of study, and use the resources to research their own topic. The method of study is based upon a process of critical reading which focuses upon 18 steps which are designed to develop in the learners an ability to evaluate critically the materials they are reading, and select that which is of use to them. Each Centre has two instructors who do not teach, but who support the learners as they develop their own critical reading. The Centres are supported by tutorial teams in each State, who provide training for the instructors.

The Post-primary Project is *post* primary, in the sense that it assumes a certain level of literacy, but can be used by the individuals in the community to pursue any educational interest, including certification at secondary level, but not restricted to that. In fact,

even the definition implied by the title of the Project is not enforced rigidly, and some individuals have used the Project to learn how to read and write, or to complete their primary education.

In practice, the vast majority of learners in most centres are young people who wish to complete their secondary education. But there have been notable instances where Centres have achieved the objectives of the Project, and become true Educational Centres. One mother spoke of her study of health issues; she had chosen to study illnesses because her children were frequently ill, and had learned a great deal about hygiene procedures as a result of which she needed to take her children to a doctor much less frequently. Others spoke of similar individual learning which had been advanced by the Centres.

However, the most striking successes have been achieved where groups within the community have seen the opportunity which the Centre offers in terms of support for other developments. In one community, a government agency had supplied sewing machines and minimal training, with the intention of stimulating

an economic development. But the training had been inadequate, and the sewing machines were languishing in their workshop. Women from the community approached the instructors in the centre, and asked for support in studying the instruction manuals of the machines (in practice, support in learning to read and write, but for specified



Don Fidel a mature student from the Post-Primary Education Project, gives his first public performance, after fulfilling his twenty-year old dream to learn how to play the guitar.

purposes).

After a short while, the sewing machines were being put to use, producing clothing for members of the community, and the women again approached the Centre to ask for support in how they could develop their own small business producing clothing. CONAFE secured the services of a visiting tutor from a Non-Governmental Organisation which specialises in such developments. There is every chance that the investment which was originally going to waste will achieve its original purpose, thanks to the support of the Post-primary Project.

Although this example was remarkable, it was not unique. Other communities have learned how to cultivate edible fungi, which they add to their diet or sell. And we saw one centre which had a vegetable garden, which was being used to study which plants could easily be grown in the locality to supplement the diet. In the same community individuals spoke to us about their need to understand species which were being introduced by government agencies, including varieties of maize, sheep and chickens, which had produced a range of difficulties for them.

Complex Issues or Technical Fix

What advantages does a sheep from New Zealand have over a locally bred, Mexican sheep? According to the farmer who presented us with the question, the New Zealand sheep is more expensive to buy, has to be given special food, and tastes insipid, compared with the cheaper, tastier Mexican breed, which forages for itself in the community. So why is the government agronomist promoting the New Zealand variety?

There probably is an answer to this question. New Zealand farmers fatten sheep for market; a sheep which takes longer to put on weight is a cost to the farmer, and economically less viable. But in order to understand what makes a New Zealand sheep economically desirable, one needs to understand the market conditions in which they are raised. A month more or less having a sheep foraging around the community is of no importance to the subsistence farmer in Mexico, and any economic advantage is completely invisible.

At one level these issues are extremely complex. If we wish to know which reforms will be successful and which will not, then we need to bring to bear a range of intellectual tools. But at the level of the technical fix, the issues are very simple. A new breed of lamb has been introduced to Mexico, and the farmer can see very easily that it is going to cost him more to get a product he likes less. As a technical fix, the innovation is a complete failure. We are unlikely to see more New Zealand lambs in the State of Mexico. And what we need to understand is, that from his perspective, the farmer is absolutely right to see the experiment as a failure; this is not a failure on his part or lack of understanding.

Similarly, the introduction of potatoes to the community cited above was seen as a technical fix. Again, in market terms it was a failure. But as the history of the potato in Europe demonstrates, one of the great advantages of potatoes as a food crop is that they can be stored for long periods. Traditionally, stored in clamps, and dug up as the need arose, they provided a year-round supply of food in Europe, long before there were commercial cold stores. But as to

the details of that traditional technology, and whether it could be applied in Mexico, we are sadly ignorant. Where is the knowledge of those traditional practices? And who will be able to develop it to apply it in new circumstances?

In short, as a series of technical fixes, rural development is doomed to be a failure. What is needed is a more complex understanding of the changes which need to be brought about. Some of the knowledge will be readily available, while the rest will need experiments, and an enquiring approach. The challenge is to develop a system which can meet these needs.

Ecological Gardening

The story of the plague of insects which had accompanied the introduction of the new variety of maize put us in mind of our only lesson in ecological gardening. We have no idea whether the new pest had in fact been brought with the new seed, or whether it had arrived at the same time by unhappy accident, but it occurred to us that it needed to be controlled, and by farmers who had very limited cash resources.

Many years ago a friend of one of us, who happened to be a biochemist, had a plague of greenfly on his roses. What he needed, he argued, was a predator that lived on greenfly, in order to keep the pest in check. His choices, he said, were the ladybird and the hoverfly. The ladybird was the preferred choice, in the sense that it killed more greenfly. However, having dealt with the bulk of the greenfly, the ladybirds would die because their food supply had disappeared. And thanks to the remarkable reproductive capacities of greenfly, his plague would soon be re-established. The hoverfly was a less efficient predator, but for that reason would never kill off its own food supply, and would keep the greenfly in check in perpetuity.

The final piece in this jigsaw was a plant which would encourage the presence of hoverfly in his garden, and so solve greenfly problem. Sadly I cannot remember the name of the plant, but I know that it was a fairly common garden plant which he added to his garden with the desired effect.

What the mountain farmers would need to control the pest, then, was a plant which could be grown with the maize, that would encourage an appropriate predator. Or rather, what they needed was a biologist, with an extensive knowledge of local plants and insects, who would know exactly which combinations would flourish in the particular micro-climate of that part of the sierra. And it occurred to me that their chances of finding one were smaller than my chances of finding a biochemist who understood the intricacies

of the flora and fauna of a garden in suburban London. Academic knowledge, presumably locked away in departments in Mexican universities would provide part of the answer, but it would need to be taken out to the field and applied experimentally to meet the needs of this community. Who could be relied upon to do that?

Sadly, the only people with any real incentive to solve this problem was a group of peasant farmers. And if they were to solve it, they would need access to resources they did not have, and an educational preparation which would enable them to apply the knowledge they found.

The technical fix in rural reform and the traditional model of education derive from the same root. They assume that the expert has the knowledge, and can transmit it to the learner who was previously ignorant,

and that the outcome will be new knowledge on the part of the recipient. The technical fix does not work in rural reform any more than it does in the classroom, because the learner already has a great deal of knowledge, about his or her own circumstances and about his or her own value system. The expert generally knows less than they believe, and certainly

understands the learner's position only imperfectly. For the learning/reform to be achieved successfully, the learner must be actively involved, taking, examining and evaluating what the expert offers, and testing whether and how it applies in their specific circumstances.

The Post-primary Project offers an educational model in rural areas which promotes the latter sequence of processes. By putting the learner in control of the choice of topics, and by using the steps of critical reading to stimulate the learner to think about how anything they are presented with relates to their own circumstances, the Project provides the mechanisms for the educational base for rural reform.

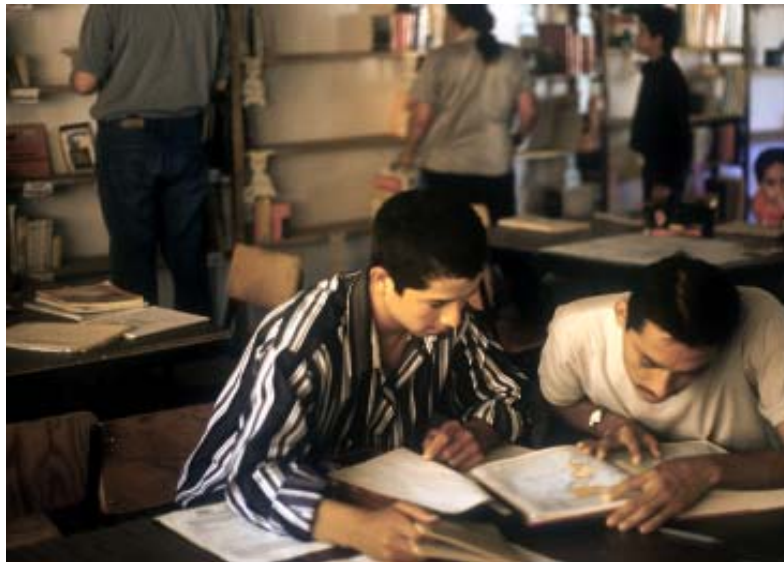
Process Design

As can be seen from the above analysis, the failure of much rural reform stems from a shortage of two

commodities; a free flow of academic knowledge to inform the process, and of educated personnel who understand the local circumstances to apply it.

If we were talking about the design of a mechanical process, rather than investment in education, the solution would be immediately apparent. If we were manufacturing a piece of machinery, in which most parts were available from many suppliers, but where each machine needed a special widget available from only one source, we would hardly need to think twice about the solution. The expense in stockpiling widgets would be easily justified. In fact, in terms of a general solution, the creation of reservoirs and stocks at points immediately prior to bottle-necks is common practice.

In this sense, the Post-primary Project can be seen as providing a stockpile of the two products which are in shortest supply in terms of rural reform; a resource



Students make full use of the resources at the Centro Educativo, Los Cedros, in the mountains of the Sierra Madre Occidental.

in terms of providing academic information, and local people prepared with the elementary study tools to make use of the resource and apply it to their own conditions. Where the principal shortage is in terms of prepared personnel, as in the case of the sewing machine initiative cited above, the Project has already shown its value. Where the principal shortage

is of specialised academic knowledge, the case is less clear.

This is because the resources available within the Educational Centres are currently fairly limited, and consist in large measure of school text books and non-specialised reference works. There have been occasions where links with universities have provided an appropriate source of academic understanding, as with the link between a community and a university in the United States, to transfer knowledge of ecological earth closets to the community. Similar links between a university in Mexico and centres to develop materials related to mathematics have been similarly successful. However, if we look at the range of possible topics which information could be needed on, from rearing chickens to storing potatoes, the weaknesses of the current resources are only too obvious.

One possible solution to this problem is the Internet. The Internet provides access to a wide range of academic and non-academic material which could be useful in these circumstances. For example, in this way farmers in Mexico who wanted to know about organic compost could be in touch with the Soil Association in the UK, or those with New Zealand sheep could be in contact with breeders of the same in New Zealand. (This obviously raises the question of language, and English teaching is already a feature of the Educational Centres. However, the method emphasises reading to extract meaning, rather than formal drill in grammar and syntax.) On these grounds it is reasonable to assume that the Internet will provide a vital strand within the Post-primary Educational Centres in the near future.

But as anybody who uses the Internet will also be aware, it contains the most extraordinary amount of rubbish, too. And even that which is not rubbish, will include a great deal which is irrelevant to rural communities in Mexico. Developing those skills of critical reading which will enable learners to sift and evaluate the material which is presented to them will be even more valuable once access to the Internet is opened up.



At the end of each topic the learner presents his or her learning experience to the whole community

In the short term, there are reasons why the Internet is not available option. In one community which we visited, there was only one telephone line, and providing regular connection to the Internet for the Educational Centre would imply removing a valuable resource from the community. Other Centres use Edusat, a satellite system, to connect them to a national network. But the availability of technical support to maintain these systems in rural areas is limited, and the service is poor. Reducing real prices and improving quality is likely to solve these problems, although for precisely that reason high levels of immediate investment are probably not justified.

Evaluation

The nature of the Post-primary Project makes a formal evaluation very difficult. The Project is well defined in process terms; it aims to provide an education

appropriate to the individual, meeting their needs and giving them the tools of critical reading to advance their personal studies. However, in product terms, the project is much less clear.

Formally, certification of education at various levels is not a goal of the Project. In practice, the majority of those using the centres do, in fact, choose to follow a programme which can be certificated. But certification is handled by a different agency, INEA (Intitución Nacional de Educación de Adultos, or National Institute for Adult Education), and consequently successful certification is recorded as a successful outcome for INEA, even though it has not invested in the educational process.

Equally, where the Project has been closer to its aims of advancing the life-long education of adults, the most obvious effects have been produced where the Project has enabled other projects to work. Needless

to say, these “successes” also have other claimants, and it is certainly true that the Post-primary Project does not have the resources to bring about successful economic and agricultural change.

In these senses, therefore, the effects of the Post-primary Project are largely negative, in the absence of failures in other

projects. In the same way, a stockpile of widgets has no effect upon the productive output of a factory; it is the absence of widgets which has a catastrophic impact upon production. Stocks appear to tie up investments without benefit to the process. For precisely this reason, we have seen in recent years a move towards reducing stock levels to the minimum which will ensure that production can be managed, with emphasis upon secure supply rather than stocks. But we also have the development of stochastic techniques designed to deal with random calls upon supplies, as in the techniques of operational research, critical path analysis and queuing theory.

The problem is that we really do not have the corresponding information about the need for educational support in projects of rural development.

We know that many attempts to introduce change have been unsuccessful. But that is very far from knowing on how many occasions a project which would have been successful with educational support has failed for lack of it. We simply do not have an inventory of virtual “calls for education”, in the same way that a factory has an order book.

What we do have, in the case of the Post-primary project, is an example of an educational development which appears to be meeting exactly this kind of educational “call”. Not unreasonably, the effectiveness of these calls has been slow to mature, and the Project is not equally effective in all areas. The results achieved so far suggest that a general level of critical education may be exactly the ingredient which has been lacking in many previous rural reform projects.

There is an opportunity here to investigate further the anatomy of rural reform, but in order to achieve this there would need to be a closer coordination between educational efforts and efforts in other areas. There would also need to be a close link between the Post-primary project and appropriate sources of educational information. This goes beyond material resources, and includes qualified and interested personnel. For example, we saw evidence of students studying simple genetics. We also heard complaints

about maize seed which could not be kept from one year to the next. We did not see that a connection was being made between these different areas. Strong links with university departments (perhaps with students “seconded” to the project for social service) might be able to provide the kind of imaginative input that would bridge some of these gaps between theory and practice.

There are, of course, risks in urging such links between the Post-primary Project and other projects. As noted at the very start of this paper, educational projects tend to be the poor relations when put alongside investment in technical fixes, and there is always the possibility that the ideology of the quick fix will invade the Post-primary rather than the methodology of liberal, critical enquiry informing the technical projects. But there is certainly something in the Post-primary Project which is working well, and it would appear to make sense to ask how to maximise the positive effects which are already visible.

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THE FORUM

Over the past eighty years, *New Era in Education* has provided readers with much interesting and stimulating food for thought. We hope that the present issue is no exception to this pattern. But good communication is a two-way process. All too often, readers who are inspired by what they read have no outlet to share their inspiration with others. Authors often welcome helpful comments and further considerations which might enhance the value of the work reported in our columns or suggest new avenues for their on-going research.

In future issues of *New Era in Education*, we hope to publish a column under the heading of “the Forum” in which readers can add points and comments which further the ideas and discussion in the refereed articles. If you would like to make any comments or responses to articles in this or previous issues of the journal, please write to the editor or send an e-mail under the heading of “forum” to **d.a.hinton@uel.ac.uk**.