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Education for Integrated Rural Development: transformative learning in a complex and uncertain world

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Education for Integrated Rural Development: transformative learning in a complex and uncertain world

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A key question addressed in this article is: How does the increased pressure for expertise in IRD translate itself into the demand for educational services and the design of appropriate curricula on a European-wide basis? This article examines these issues and generates a number of stepping stones for the development of Education and Training for Integrated Rural Development (ETIRD) in tertiary education, based on a two-year inter-institutional curriculum development project carried out under the umbrella of the AFANet[1].
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Introduction

As land-use claims increase in not only Europe but elsewhere in the world as well, whilst at the same time the amount of rural space available is on the decline, the need for a more integrated approach to agricultural production and the development of rural areas becomes more apparent than ever. Integrated Rural Development (IRD), is an emerging concept or theme in agricultural reform in theory, policy and practice. The objective of IRD is to raise the level of economic performance in all sectors of the rural economy, to promote the shaping of viable rural communities, to maintain indigenous cultures, to protect the environment and to conserve the natural features and appearance of the landscape (Wals, et. al, 2004). The EU has been developing its policy for rural development laying stress on an integrated approach, simplification and sustainability. These developments present exciting challenges and obligations for agricultural and forestry education sectors which have a mission to help rural society grow and develop, and to provide the new skills, competencies and knowledge conducive to such development.

Research objectives

The overall aim of the ETIRD research project was to explore, outline and develop communication, education & training strategies which are sensitive to and build upon both universal (i.e. European) and contextual (i.e. local or regional) conceptions of IRD. The project team was composed of six experts in either rural development or curriculum development or both and represented higher education institutions in four European countries (Denmark, Italy, Malta, the Netherlands, and the United Kingdom). The objectives of the project, as identified by these experts, were to:

1. make an inventory of current curriculum responses to changes in rural land use within European Institutions for Higher Agricultural Education,
2. investigate Communication, Education and Training (CE&T) programmes that are suitable for developing notions of IRD among students, that is, problem-based learning, (soft) systems thinking, interdisciplinary learning, social learning,
3. describe four case studies of CE&T programmes for IRD in Europe (focusing on

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learning goals, learning and instruction methods, contents and learning outcomes),

4. share and reflect on participants' experiences with alternative learning and instruction methods for teaching and learning for IRD, and

5. generate general guidelines for the development of CE&T programmes for IRD in Europe, complemented with examples of the contextual application of these guidelines.

In this article we will briefly touch upon the first four objectives and will then elaborate on the results related to objective five.

Research method

In order to realise the objectives listed above, a research cycle was designed that contained five key elements, which will be discussed briefly (Figure 1).

The first phase of the research consisted of an open exploration of different conceptualisations of IRD and curricular responses to IRD in Europe by the members of the AFANet Team, followed by an inventory of existing ETIRD courses and programmes. This inventory was conducted using an on-line survey and the AFANet database of institutions active in higher agricultural education. The second and third phases consisted of the development and comparison of four case studies of institutions that were selected as being of potential interest to others due to their innovative approach to ETIRD. The cases were selected on the basis of the outcomes of phase one. Phase four consisted of the generation of, so-called, stepping-stones for conceptualising IRD and appropriate curricular responses. In phase five the original conceptualisations of ETIRD were revisited in order to understand how they changed as a result of the research. The research itself can be viewed as a learning cycle.
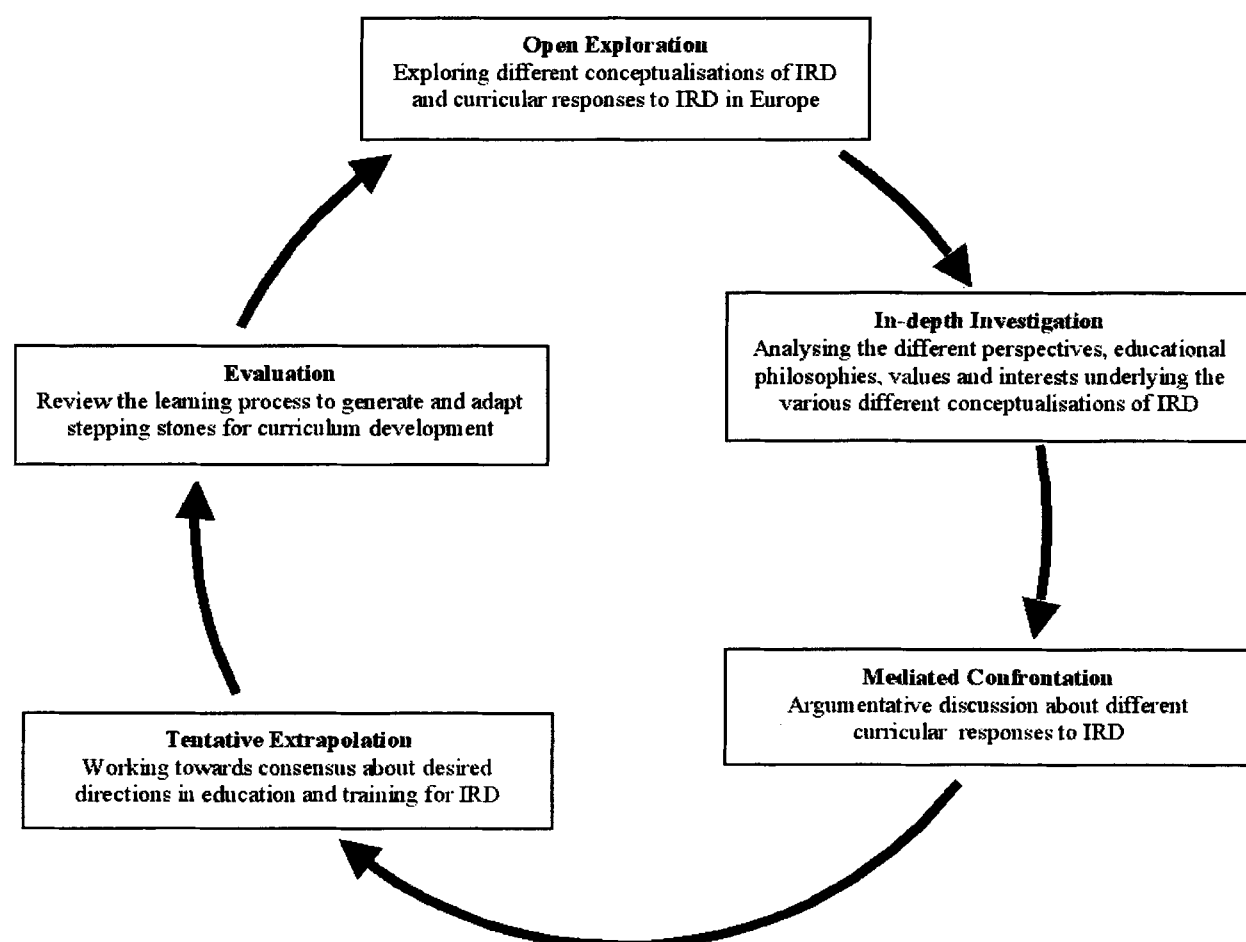

Figure 1: The ETIRD research cycle

Inventory of current practice

In the first phase (inventory phase) of the research a link to an on-line survey of rural development education and training programs was sent to just over 200 people working at agricultural universities or colleges in areas related to rural development. The main purpose of the survey was to explore, outline and develop communication, education and training strategies which are sensitive to and build upon universal (i.e. European) and contextual (i.e. local or regional) conceptions of rural development.

In the end eighty-two people participated in the survey of which 78 represented institutions based in Europe, two institutions based in Africa and two institutions based in North America. The main results of the survey can be summarised as follows:
- All respondents considered rural development education as an interdisciplinary field;
- More than 2/3 of the institutions represented by the respondents created web-sites providing more information about their institution and the specific programmes taught;
- Most participants in the survey were highly ranked within their institutions;
- About 1/3 of the institutions involved taught rural development as a separate course or module;
- Many (2/3) respondents expressed their willingness to participate actively in the development of case studies of exemplary ETIRD in the next phases of the research.

The sometimes elaborate answers to the open-ended questions, formed the basis for discussion about the goals, content and process of ETIRD and the basis for selecting the four cases that would be developed in the second phase (in-depth investigation phase) of the research. Based on the respondents' input to each question, institutions represented by those who answered most or all questions were identified as potential case-study institutions. In order to narrow down the total number of potential case studies selection criteria were used. Inputs were chosen if they provided:
- a clear and detailed description of the learning goals,
- a clear and detailed description of the teaching approach,

- an in-depth description of their perspective on rural development, and
- evidence of the respondent's willingness to become part of the research group as a case study key-informant.

Based on these criteria, 28 short institutional profiles were generated. These profiles helped the team decide what institutions to select for more in-depth investigation. Box 1 (see next page) contains an example of such a short institutional profile. More short profiles can be found in Wals et al., 2004.

The results of the inventory show a number of common patterns. In terms of the descriptions of the learning goals, most respondents emphasise the promotion of a systemic or broad view, and the ability to act and think out of 'the disciplinary box' in a more holistic or integrated way. Furthermore, many stress the importance of communication skills and the ability to put one-self in the position of others in an understanding and empathic way. Another learning goal that runs through many of the responses, is that of critical thinking and the ability to critically follow trends in policy-making, society (shifting consumer needs) and farming. Finally, a number of additional competencies are mentioned, including, project management, creative thinking and working in (interdisciplinary) teams.

When looking at the teaching approaches that are favoured by the respondents we again see more similarities than differences. Most stress interactive forms of teaching and learning such as: action learning, workshop-based learning, process-based learning, and hands-on, experiential learning, all referring to learning that supports the creation of a meaningful synthesis between theory and practice and the relevant disciplines.

In terms of the the respondents' understanding of IRD, a common pattern of triple P (Planet, People, Profit) and triple E (Equity, Environment, Efficiency) oriented views of rural development emerges. All seem to call for a more systemic view of rural development involving multiple time scales, multiple stakeholders and sectors, and multiple values.

All respondents are involved in very concrete teaching and learning activities – some by means

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Institution: Agriculture University of Athens
Country: Greece
Course name: Agricultural and Rural Development

Learning Goals
Students have to acquire a broad spectrum of issues related to rural development. Therefore after the first three years (6 semesters) of subjects relating to various disciplinary aspects of agriculture (including: Political Economy, Microeconomics, Introduction to Agricultural Economics, Rural Sociology, Macroeconomics, Applied Economic Statistics, Agricultural Production Economics, and Mathematics of Finance), a wide range of more interdisciplinary courses is provided, such as: Agricultural Policy, Farm Management, Comparative Agriculture, Quantitative Methods in Economic Analysis, Agricultural Marketing, Analysis of the Pricing of Agricultural Products, Agricultural Credit and Finance, Agricultural Education, Agricultural Extension, Agricultural and Rural Development: Theory and Policy, Methods in Agricultural Economics and Social Research, Cooperative Economics, Agro-environmental Policies, Economics of European Integration, Assessment of Agricultural Investments etc. Furthermore, students have to submit a thesis (10th semester). Therefore, students are provided with knowledge relating to the economic, social and environmental dimensions of rural development along with solid knowledge concerning technical aspects of agronomic education and training. The overall aim of the Department concerns the provision of knowledge which, in turn, will allow the students to become capable professionals in the field of sustainable development in rural areas while taking into account the broader framework, i.e. European Integration as well as the world-wide developments concerning the agro-industrial and market conditions.

Teaching approach
In brief, a process-oriented curriculum is needed. The approach has to be systemic/ holistic globally-oriented, and interdisciplinary, involving elements such as learning through action, team work in small groups, learning for an open mind and careful facilitation. Thus, education has to involve elements of creative education like inquiry, discussion, planning, co-operation and appropriate action. Group-work is necessary as it advances communication skills, reinforces the importance of citizen participation, creates meaningful learning situations for students, utilises the interests, creativity, and curiosity of students as it does with controversy which is thus turned to a source of conceptual change. This way, learning is the continuous process of conceptual change and central to this is helping students to advance their learning strategies. Within such a context teachers are to be viewed as facilitators and co-learners. They facilitate learning by providing learning experiences that induce change through debate and dialogue. Teachers have to have the qualities of 'transformative intellectuals'.

Understanding of Rural Development
It means a new paradigm for rural development taking into account the socio-cultural, economic and environmental aspects. The overall aim has to be the close examination of the dynamic balance among many factors such as political, technological, economic, ethical, cultural and environmental. Nowadays, rural development represents a 'way out' of the limitations and lack of prospects intrinsic to the modernisation paradigm and the accelerated scale-enlargement and industrialisation it entails. This new paradigm is of a multi-level, multi-actor and multi-facetted nature. In this context the farming/rural systems approaches have to be utilised in order to understand the multiple dimensions and possible synergies (as well as the negative feedback). Within the framework of rural development new forms and mechanisms for co-ordination and conflict management must be developed; methodologies have to be of a participatory nature.

Box 1: Sample institutional profile based on the on-line survey

of a special course or module, some by means of a special degree and some by means of regular courses that seek to include some of the aspects listed above. The case-study component of this research was designed to explore good practice in-depth and, in a way, to worthwhile to check how these lofty intentions manifest themselves in practice. In the next section we will highlight the four cases that were selected for further in-depth analysis.

In-depth case studies

According to Yin (1988, p82) case studies allow a researcher to 'reveal the multiplicity of factors [which] have interacted to produce the unique character of the entity that is the subject of study'. It is a method of learning about a complex instance through description and contextual analysis. The result is a description and theorizing about why the instance occurred as it did, and what may be important to explore in similar situations. A case study:

> *investigates a contemporary phenomenon within its real-life context; when the boundaries between the phenomenon and context are not clearly evident; and in which multiple sources of evidence are used.* (Yin, 1989, p 23)

Case-study methodology, therefore, is an appropriate research tool to the incorporation of IRD in agricultural education. The case-study approach allows the researcher to experience phenomena in their context, to learn what works and what does not. An important feature of case-study research is its flexible and adaptive nature.

The members of the ETIRD research group took a closer look at the 28 institutions which not only provided sufficient information for generating an institutional profile (box 1), but also expressed willingness to participate in the in-depth investigation phase of the research. They did so by studying submitted documents and the web-links they provided. Each of the core-group members got an opportunity to express his preference for certain institutes for further exploration and analysis. It was decided that a good geographical distribution was important to allow for possible regional differences to emerge. As a result, the team looked for one institution from the South of Europe, one from the North of Europe, one from Eastern-central Europe and one from Western Europe. Using the criteria from the on-line survey results, in combination with the personal knowledge of the individual core-group members of the various institutions, the following cases were selected:
- University College Dublin (Ireland),
- University della Tuscia-Viterbo (Italy),
- University of Córdoba (Spain), and
- the Czech University of Agriculture Prague (Czech Republic).

These four institutions were visited by one of the working-group members for a two-day period during which a number of people were interviewed about the program (instructors, students and administrators). The site visits resulted in four cases, which were validated by those who were interviewed.

A list of guiding questions for case-study development was generated that were divided in six categories based on work carried out on sustainability in higher education (Corcoran et al. 2004): ideology, programme drivers, responsiveness, institutional linkages, access and pedagogy. The categories and their questions have been listed in Table 1 (see next page). 'Programme' here refers to a combination of courses and or modules that, depending on the situation, may or may not constitute a degree.

The research team decided that the case studies did not need to be structured identically and that it would be unlikely that all of the questions raised above would be tackled but that, to allow for some kind of analysis and comparison, they should at least touch upon the following:
- Personal history of the programme co-ordinator/developer;
- History of the development of the programme (how it evolved, barriers encountered, how the barriers were resolved, any partnerships);
- The ethos of the programme (what is special about the programme, is there any competition with other programmes);
- The target audience (a brief bio of a typical learner) and the number of learners attending the programme;
- Level of education and entry requirements;
- Aims and objectives of course, module and/or degree (depending on the situation);
- Curriculum plan: main areas addressed, assessment methods adopted, interface with outside organisations/institutions);
- Learner evaluation of the programme;
- Programme evaluation by the programme co-ordinator;
- Plans for future development of the programme.

For the purpose of this article we have distilled the main conclusions of the analysis of the four case studies (for full-fledged descriptions of the four case studies see: Wals et al., 2004). What is presented here can be viewed as a meta-analysis of the four case studies.

A. Ideology (values/ethics)

Is the programme's ideology explicit or not?
Is the programme needs based?
What is the balance between cognitive and affective objectives?
Are sustainability issues coupled with issues about responsibility?

B. Programme drivers

What is the programme's ideology?
Who/what are the programme's drivers (market, client, beneficiaries)?
From where do funds for the programme come from?
What is the policy of the programme?
How does the programme address the needs of the individual/people?
What RD needs are addressed by the programme?

C. Responsiveness

Does the programme respond to learners' needs?
Does the programme respond to employers' needs?
Does the programme respond to the needs of those interacting with the learners?
Is peer opinion about the programme sought and valued?
Does the programme give space for critical reflection?
How is quality assurance carried out?
Is programme evaluation formative or summative?

D. Institutional linkages

Is the programme linked to other learning initiatives?
Is learning driven by links to networks and/or NGOs?
Did curriculum development involve any partners?
Is there evidence of any networking activity on an academic level? on a local level? on a global level?
How does the programme fit in within the overall institution's educational framework?

E. Access

Is the programme flexible to respond to different learning styles?
Does the programme have flexible entry/exit points?
Does the programme offer distance-learning opportunities?
Does the programme offer opportunities for part-time learning?
Does the programme cater prepare learners for lifelong learning?

F. Pedagogy

Does the programme promote active learning?
Does the programme address equity/ethical issues?
Are the learning experiences presented problem based/experiential?
Is the approach adopted systemic/holistic, hence promoting system thinking and system practice?
Is the distinction between theory and practice blurred or highlighted?
Do learning experiences presented foster lifelong learning?
What are the learning outcomes of the programme?
What are the competences developed through the programme?
Does the programme develop conflict resolution skills?
Does the programme help learners to adequately explore sustainability issues?
Does the programme present concepts (e.g. sustainability) as fixed or negotiable concepts?
Does the programme encourage multiple perspectives?
Does the programme give adequate attention to the development of values?
Is espoused theory matched with the theory in use in the programme?
How is knowledge acquired during the programme? Is it discipline-driven?
Is IRD learning clearly sequenced?
What are the assessment approaches adopted by the programme?

Table 1: Guidelines for generating ETIRD case studies (free after Corcoran et al., 2004)

Results

One of the key observations the four cases seem to share is that highly motivated and dedicated people are the main driving force in curriculum change. They are engaged in such change for a number of reasons, but a key one is the desire to educate graduates who can work in the new, more sustainable, post-productioist rural economies. There are important differences of a personal nature (epistemological vantage point, personal values, personal experiences and social networks), and of more contextual nature (rural history of the region, rural policy, local economic outlook and trends, links or lack thereof between tertiary education and the rural communities), that lead to different institutional responses to the challenge of designing education for IRD.

There are also differences in the way 'change' is conceptualised by the various actors involved in curriculum response to a changing world. Some lean towards a radical transformation of ideology of teaching and learning and equate 'integration' with the inclusion of systemic thinking, holism and transformative learning. Others, perhaps more pragmatically, opt for a more adaptive and conservative approach and prefer to renew existing courses, improve links with the community and integrate emerging concepts, while discarding old ones that have become fruitless. In the four cases, but also in the responses to the on-line survey, a whole range of approaches to teaching and learning can be found, often closely related to a particular view of what constitutes 'knowledge', 'research' and

'curriculum'. Some stress the importance of preparing students to be competent and skilful workers with a healthy work ethic (tendency towards *a vocational/neo-classic orientation*). Again, others stress the importance of equipping students with the competences and skills that help them succeed in a competitive, globalising market-oriented world (tendency towards a *liberal/progressive orientation* of curriculum development). There are also those who stress the importance of engaging students in critical thinking, action taking and helping them cope with uncertain futures and ever changing realities (a tendency towards a *socially critical orientation* of curriculum development). Table 2 shows three different perspectives on teaching, learning and research that in reality might not be as clear-cut as presented here.

The epistemological paradigm shift towards a systems perspective is a strong influence in some cases, but certainly not in all cases. Many involved in curriculum development have simply sought vocational sensitivity, which has required new courses, without advocating a paradigm shift. The courses and degree programmes that we examined are a manifestation of this practical response as well as of new thinking. In practice we see a mixture of giant leaps and small steps. Such changes, big and small, are often a function of changing values, interests, perceptions and experiences of people active in further and higher education.

A number of the barriers of adopting an integrated approach to curriculum development

	Scientia	Techne	Praxis
Focus	Learning for knowing	Learning for doing	Learning for being
Knowledge produced	Propositional	Practical	Experiential
Structure	Subject disciplines	Crafts/Skills	Issues/Competences
Teacher's role	Expert	Master	Facilitator
Teaching strategies	Lectures on theory	Practical instruction Demonstrations	Real-world Projects
Research style	Basic (Experimental)	Applied (Developmental)	Action (Participative)
Research goals	Abstract-universal knowledge	Workplace Solutions	Contextual knowledge Action for change
Basic philosophy	Positivism	Utilitarianism	Constructivism
Focus of reflection	What do I now know?	What can I now do?	Who am I becoming?

Table 2. Some distinctions between different traditions of knowledge and knowing (Adapted from: Bawden and Macadam, 1991, p. 4)

were identified. These barriers include the deeply entrenched patterns of reductionist and disciplinary thinking that characterise so many institutions of 'higher' education. A systems framework is offered by some of the institutions as a way out of these, what they see as, unproductive, ultimately, irreversible and destructive processes.

A systems perspective on curriculum change as a means for accommodating more integrative approaches to teaching and learning (process) and rural development (content), perhaps does not fully reflect the gradual, messy, stuttering process that more accurately reflects how, in most cases, progress in curriculum design in IRD moves forward. In some cases there are significant key events that may trigger curriculum change, for instance, when new powerful or inspiring (or both) personalities engage in curriculum development, or when a new European Policy on Higher Education becomes effective (for instance the introduction of a European Bachelor-Master structure and the European wide introduction of the ECTS-system), or when a decline in student numbers require a major overhaul of existing programmes. Hence, the turn to a systems approach and the need for an alternative ontology/epistemology that emerges out of the four case studies should not be seen as a prescription but rather as a critical consideration that might be considered along with others. One of those, present in all four cases covered, is a very pragmatic one driven by the current socio-cultural and economic reality that many rural area's in Europe are currently facing. It can be argued that in economic, social and cultural terms the 'old rural,' made up by the occupational community of those working the land, has been supplanted by a 'new rural' with businesses not necessarily connected directly to the land (i.e. tourism and other services, which are part of rural development and need to be integrated into a new consumption-oriented approach to RD). In some areas, this trend is enhanced by a growing new rural population alongside a declining farm population. It should be no surprise that many higher agricultural education institutions respond to these trends by creating new courses and programmes that address these changes without necessarily re-thinking their educational philosophy. It is with this in mind that we introduce a systems perspective

as one of the stepping stones for curriculum development.

A systems perspective for IRD curricula

Rethinking the curriculum means discussing the changes in teaching, learning and instruction that are needed to better link the academic world to today's global realities. According to a survey of the agriculture teaching programmes of related universities in Europe (Phillips, 1999), most graduates felt that their exposure to relevant practical experience was lacking, as was their training experiences in the environmental aspects of agriculture. To overcome the growing mismatch between the requirements of the curriculum and the realities of life, it is necessary to develop new epistemological, ontological and methodological tools in order to give a more coherent view of knowledge and more authentic and meaningful view of life. These new intellectual and organisational tools will help in the challenge to better understand reality.

One of the most powerful examples of an integrative approach is the systems paradigm, which calls for a change from a discipline to a systems focus. To explain the structure of reality, the processes involved, and the role of humankind in these structures and processes, the use of a holistic type of instrument called "systems thinking" has been suggested (Boulding, 1956; Checkland, 1981). The systems field is predicated upon the belief that reality is a unified whole. Historically, the term and the philosophy of holism was originally developed by Smut (1927) and scientifically elaborated by Tansley (1935) who used the concept of ecosystem of which people and their activities are fully part. Dating back to the first formulations of this concept (Tansley, 1935), human activity finds its space in ecology as an extremely powerful biotic factor that tends to increasingly disturb the balance of pre-existing ecosystems and in the end destroy them. The systems paradigm spotlights the deeper pattern which connects all phenomena and proposes that diverse aspects of reality – physical, biological, social and technological – can be better understood and handled when treated as systems of interdependent parts that interact with their environments.

Curricula based on a systems paradigm offer an educational process more appropriate for an era

of limits. The interpretation of our planet as the ultimate global ecosystem requires an acceptance of natural limits to human activities and serves to instil a context culture, where a sense of belonging and responsibility for sustainable development are promoted. Curricula designed to foster social and environmental interdependence have more chances to offer students multiple opportunities to experience learning within the context of their neighbourhoods so that the acquisition of important skills and knowledge is not de-contextualised but embedded in a process of shared existence. Knowledge of local cultural traditions and sense of affinity with the regional environment help prepare students to take an active role in the care and governance of their communities once they have graduated (Smith, 1993).

Global problems are systemic (Malone, 1990). Education for global problems demands an understanding of the underlying ethical attitude of our activities. One of the most critical challenges in restructuring natural science dominated curricula is incorporating ethical and aesthetical dimensions of learning. The centrality of values (like sustainability) emerges in a curriculum based on a systems approach. Values are not a separate category of the mind, but arise out of a comprehensive understanding of reality, our worldview (Clark and Wawrytko, 1990). The sense of good and the sense of beauty are part of our human dimension. The ontological assumptions derived from the ecosystem concept that all life forms are inextricably connected (religion of connectedness) in a finite and beautiful planet calls for the urgent need to protect the ecosystem of which we are part, by assuring sustainability of our human activity systems. Universities and schools have a responsibility in re-examining current perceptions of nature, of the world and of human society in the light of the reality of resource depletion (see also Corcoran & Wals, 2004). They have a responsibility to (re)develop curricula and structures to help students deal with a world of limits rather than a world of expansion and growth (Smith, 1993).

Methodological tools

Traditional methodologies inspired by a monodisciplinary curriculum structure tend to foster in learners a fragmented view of reality because their main focus is success (e.g. passing

an exam or getting a proficiency certificate) in separate fields of learning. Learners find it very difficult to integrate uncontextualised and unrelated knowledge and skills to resolve real-life issues. Methodological tools inspired by the systems paradigm can be helpful in improving connections between a curriculum as a whole, its external context, and within the curriculum components themselves (internal tools). External methodological tools help to introduce a broad concept of teaching and action-based learning. Integrating the expertise of farmers, business owners, government specialists, and non-profit groups can enrich the educational process by offering different perspectives and ways of knowing (Francis et al., 2001). Moving students into the discovery made through case studies engages their multiple senses when they become immersed in the real-world context in which learning takes place. Case studies, interview and survey techniques, time-series measurements, and activity calendars can be taught and applied to answer questions about integration within the whole agro-ecosystem hierarchy (cropping systems – farming systems – regional systems – global systems). These approaches require several changes in attitude and organisation. New sources of funding and revised systems of administering research funds will be required to promote this approach successfully (Stark, 1995).

Tools are also needed in order to give more internal coherence to a curriculum. This requires more integration of the disciplines. Thus, all levels of approaches to integration (multi-disciplinarity, inter-disciplinarity and trans-disciplinarity) are probably needed. Multi-disciplinarity generally means bringing separate theories, skills, data and idea to bear on a common problem, while inter-disciplinarity involves bringing together people and ideas from different disciplines, to jointly frame a problem, agree on a methodological approach, and analyse the data (Golde and Gallagher, 1999; Hammer and Soderqvist, 2001) Finally, trans-disciplinarity implies full interaction between disciplines from an issue-based perspective. According to Hammer and Soderqvist (2001), integrative approaches could be addressed in course programmes in several ways, including:
1. inviting external lecturers from other disciplines;
2. having seminar exercises and discussions with invited lectures from other disciplines;

3. mixing students from ongoing disciplinary courses for joint exercises, and
4. offering full transdisciplinary courses and programmes.

The efforts in this list range from the most basic (1) to the most completely integrative (4). Although the latter type of effort is desirable in many respects, it is likely to require relatively well-developed and integration-oriented organisational structures, such as interfaculty degree courses or courses/modules.

More internal coherence also requires more integration between teachers and students. Creating a truly integrated curriculum entails that the two groups become reciprocal members of a shared, self-critical learning community. This can be achieved through:
- creating a community (amongst learners and/or teacher - learners) that generates conversation (i.e. including such techniques as having members talk in turn to create knowledge through a process of continual negotiation and transformation);
- creating a team-teaching context. Team-teaching is an excellent way to move away from the individualistic and disciplinary mode of scholarship and research. Members of teams composed of faculty from different disciplines, often find their intellectual life more enriched (Manley and Ware, 1990). A team-taught course can be a vastly rewarding experience for both students and instructors; and
- implementing intensive programmes or courses that are not longer than two weeks (6 ECTS) in order to create more flexible didactic arrangements for approaching different contextual experiences.

Conclusions

The past disciplinary "successes" in production agriculture involved high levels of abstraction resulting in deductive conclusions, which were generalised to the real world with little awareness of the dangerous consequences of doing so. This kind of organisation of knowledge and its implications were anticipated early in the past century by Alfred North Whitehead who labelled the outcome of the whole process: "the fallacy of misplaced concreteness". Signs of this fallacy are shown in the economic paradigm which dominates our current unsustainable

development. For instance, the strongly cultivated appeal of "material externalities" occurs at the expense of other more internally driven experiences. This points at the problem of misplaced concreteness in economic theory. The fallacy of misplaced concreteness culminates in "money fetishism," which consists in taking the characteristics of the abstract symbol or measure of exchange value, money, and applying them to the concrete use value, the commodity itself. With the advent of a money economy, the most tragic human paradox has been accomplished: virtual wealth can be indefinitely accumulated in the form of money, whereas real wealth in the form of bio-physical, non-material, richness and earth habitability can be increasingly destroyed. The characteristics of the abstract symbol (non-spoilage) come to dominate the characteristics (spoilage) of the concrete reality being symbolised (Daly and Cobb, 1994).

A resilient barrier to integration in curriculum development is provided by the university research structures, which contribute to re-enforce disciplinary-oriented learning. Departments are designed to foster knowledge within their discipline, and their reputation and resources flow from recognition within their field. Most research is conducted within the established boundaries of a given discipline. Traditional doctoral programmes, which open access to academic careers, have evolved in a way that strongly encourage specialisation (Golde and Gallagher, 1999) and are at times openly hostile to interdisciplinary initiatives that are regarded as attempts to 'water down' the rigour of the discipline's research track. As a consequence, the classical organisation of university research into discrete and specialised departments provides neither the perspectives nor the tools to deal with reality, let alone to (re)design and improve it (Francis et al., 2001).

Among the human activity systems, agriculture and forestry are perhaps the most integrated, since they combine in organised systems or farms bio-physical and socio-economic components from both natural and anthropogenic sources. A sustainable integration is demanded in today's rural land using activities at any hierarchical level, from the local to the regional and global level. The concept of IRD has been created to revitalise the rural environment and economy without compromising the Earth's life

support systems. University has an important role to play in society by educating professionals in agriculture to help them meet the current expectations and demands. New epistemological, ontological and methodological tools based on a systems paradigm could help universities address the challenge of establishing new curricula for sustainable rural development. At the same time, society as a whole must find the right way of supporting universities in this task so that it can play its role in a learning society.

In our cases we found diversity in innovation. In addition to the epistemological "Gestalt switch" towards a systems orientation, we also found a kind of Darwinian adaptation process as institutions, and more importantly individuals, sought to survive and adapt what they had done in order to attune it more closely to contemporary demands. The resistance of the old guard is widespread. It is evident in many of the cases, as is the tendency for mono-disciplinary scientists to look down their noses at the efforts to build inter-disciplinarity.

There are some profound and unresolved paradoxes, not least the growing tension between institutional research excellence and relevance to the wider needs of rural society. This pushes interdisciplinarity and new courses to the margins and makes their establishment and financing difficult in many cases. However, new universities tend to be more closely connected to their client base and less ivory-towered than the old Ivy League type establishments.

It might help to have a systems perspective – as has been outlined here - but it is still possible to develop an IRD-oriented curriculum without it. Nonetheless, the cases and the on-line survey results do show a strong drift towards a systems-type approach as programmes are evolving. Sometimes this systems perspective is explicit and sometimes it is not.

Generally speaking, introducing IRD in the curriculum has been a struggle and will remain so as long as universities are judged on their traditional outputs in terms of narrow disciplinary research excellence. It is also paradoxical that agricultural institutions designed to be vocationally sensitive have been so critical and resistant to what is clearly led by the demands for change on the ground and the actual

changes that have swept through rural Europe, albeit in different ways and at different paces in different places. This can be explained by the attempts of those with power and resources, in both industry and education, not wishing to give these up to new activities and to deny the legitimacy of softer process-oriented approaches to education and change management. A general attitude of 'better a subsidy in the bank than a learning process to help manage change and complexity' seems to have prevailed!

Despite all this, progress has been made and will continue to be made by the actions of a few individuals motivated by their subject and capable of sparking that interest not only in their students, but also in their teaching colleagues and administrators. Their efforts greatly benefit from the vocational relevance-demands of practitioners who face the need and urgency of a more integrated approach to rural development on a daily basis in everyday practice.

Finally, reflection on the relationship and level of congruency between one's outlook on IRD and one's view on teaching, learning and curriculum development is crucial. What we see emerging from the cases is a need to understand better the connection between biophysical and human systems. This is becoming a central task for higher education propelled, in part, by the multiple market failures and externalities that are found in the rural arena. Even though education for IRD can go down a number of routes, from soft-systems based learning to a modified or a more pragmatic positivism to a socio-critical transformative learning, it appears crucial to reflect on the relationships between one's conceptualisation of IRD and one's conceptualisation of teaching and learning. When such reflection and reflexivity becomes an integral part of curriculum development, ETIRD will provide for a stronger, more meaningful and transformative learning experience that is likely to sustain itself beyond the time students spend in college.

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Note

[i] The Socrates Thematic Network for Agriculture, Forestry and the Environment (www.afanet.info)