

Guest Editorial

Ecosystem Health in Professional Education: The Path Ahead

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Abstract: This supplement shows that ecosystem health has become a vital part of the curriculum in a small number of medical, veterinary, and public health schools. This limited, but important, experience provides the groundwork for further expansion into other professional schools and into other universities. Although ecosystem health has defined underlying principles, previous experience has shown that each professional faculty should define what ecosystem health means for the institution and for its students. Based on this definition, it is important that detailed learning objectives be defined for ecosystem health as it pertains to the profession. A model for further development is proposed in this editorial. This model focuses on developing the necessary skill sets for ecosystem health education, the expansion of ecosystem health into earlier and later stages of learning (high school through undergraduate, through postgraduate, and onto practicing professional levels), and raising the awareness of ecosystem health in the local community and at national and international levels. Once comprehensive, transdisciplinary, continuous ecosystem health programs become mainstream, one can expect a “sea change” in the attention given to the interrelationship between humans and their environments, and a more concerted effort to restore the health of our planetary ecosystems.

Key words: ecosystem health, medical education, veterinary medicine, transdisciplinarity

INTRODUCTION

This supplement on ecosystem health in professional education describes a number of professional faculties in which ecosystem health has become an integral part of veterinary medicine, human medicine, and public health curricula. This supplement reports a number of the successes in introducing ecosystem health into established professional curricula. Equally important, this supplement shares many of the challenges that arose in introducing ecosystem health, and based on this initial experience, suggests solu-

tions to these challenges. Many of the educational “bugs” have been worked out with ecosystem health courses having gained widespread support and praise in selected professional schools. Having said this, most professional schools, even in these fields, let alone the many others (law, business, etc.), have no formal teaching of ecosystem health. As illustrated by the case studies described in this issue, we delight in the successes where ecosystem health has become part of professional curricula. However, much more work is needed if ecosystem health is to become, as we believe it should, a fundamental component in all professional schools. The experience of introducing ecosystem health to veterinary, medical, and public health schools described in this supplement should encourage its

further spread, both within these disciplines as well as within other disciplines. We suggest a method for this to occur—first, by defining what ecosystem health means for a particular institution and, secondly, by outlining a planning framework around which ecosystem health education may develop.

DEFINING ECOSYSTEM HEALTH WITHIN A GIVEN INSTITUTION

It is critical for each individual institution to define what ecosystem health is and how it relates to the philosophical and educational goals of the institution. Although there are a number of excellent definitions of what ecosystem health is, ecosystem health is a very broad subject and can mean different things to different people. Although there has been an effort to define exactly what ecosystem health means to everyone, there is a lot to be gained if ecosystem health has both an evolving definition and a definition that closely fits the beliefs of the individual institution where it is being taught. Having a unique definition about a subject empowers the educator to be passionate about teaching ecosystem health. This does not mean that ecosystem health can be defined in whatever way anyone wishes. One can still apply the concepts inherent in ecosystem health in a very personal way or one specific to an institution. For example, the definition of ecosystem health in a medical school (University of Western Ontario) relates more to human health than it does in a veterinary school (University of Guelph), yet all the principles and values of ecosystem health are accepted by both institutions. A rigid definition would be less useful in promoting the teaching of ecosystem health at either of these institutions.

Given that ecosystem health has a flexible and evolving definition, it is important that an ecosystem health program define the principles and values which form the basis of the individual institution's definition of ecosystem health. Once this is done, the goals of the program should be clearly defined—those ideas that the program wishes to teach and explore. Based on the values, principles, and goals, learning objectives need to be developed to provide the basis for the ecosystem health program. Serious consideration should be given to developing two levels of objectives—those which all students within a program should learn, as well as more extensive and detailed objectives for students wanting to study ecosystem health in more detail. The process of defining objectives is important

because: 1) it provides the basis for the ecosystem health curriculum; 2) it prioritizes items to be taught (especially important in the potentially exhaustive field of ecosystem health); 3) it defines for students what is expected of them, and 4) it provides the basis on which the ecosystem health curriculum can be evaluated. These objectives, combined with the principles, values, and goals, provide an identity, for the institution and the world, for ecosystem health and what it means to the individual ecosystem health program.

PLANNING FRAMEWORK FOR ECOSYSTEM HEALTH EDUCATION

Given an established program in ecosystem health with clearly defined values, goals, and objectives, what are the next steps? We would like to propose a planning framework by which one might chart the future development of ecosystem health education. This is shown in Figure 1 where we have identified three key goals for the development of ecosystem health within professional curricula: skill sets, educational level, and spheres of influence. The skill-sets axis depicts the content skills which provide the foundation for an understanding of the human/ecosystem interaction (transdisciplinarity: ecology, politics, sociology) and the educational skills that are essential for the effective teaching of an ecosystem health curriculum (curriculum design: evaluation, distant learning, and educational research). The educational-level axis depicts the continuum from primary school through postsecondary education, professional education, and continuing or adult education. The spheres-of-influence axis depicts the institutional levels in which the ecosystem health program must have an influence—at the faculty level, university level, regional level, and/or national/international level.

The details shown in Figure 1 are examples on each axis and are not meant to be exhaustive, or inflexible. The model must be adapted to the needs and philosophy of each institution. Thus each institution must define for itself which ecosystem health educational skills are important, which educational levels will be involved, and which different institutional levels the program influences. The model can first be used as a checklist of those domains in which there is established expertise. This then indicates deficiencies which need to be addressed. For example, in an institution, one might find that there is expertise in curriculum design at an undergraduate level and transdisciplinary expertise at a regional level. On the other hand,

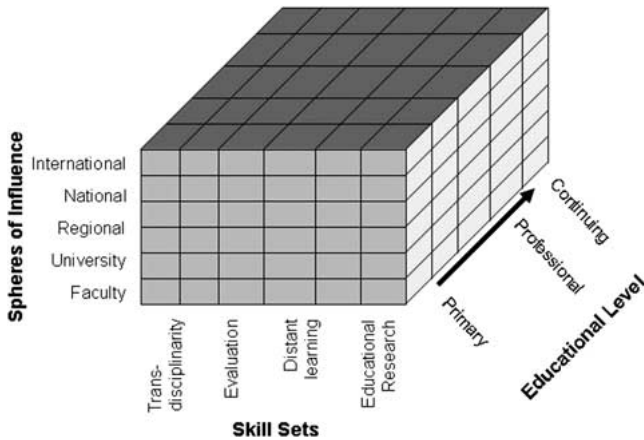


Figure 1. Ecosystem health education framework.

there may be a complete lack of skills in educational research with transdisciplinary skills present only at a regional level. An emphasis of the ecosystem health educational program would therefore be to recruit people with expertise in educational research and for existing faculty members to develop skills in transdisciplinarity at a faculty and university level. Equally, if the ecosystem health education occurred only at an undergraduate level, as the program matures, the emphasis should spread to post-graduate education and then on to continuing education. As one spreads further along the different educational levels, there should also be an emphasis on earlier education at nonprofessional degree levels, high schools, and primary schools. The emphasis of the model is for a program to identify its strengths and weaknesses and “fill in” the spaces in a carefully defined strategic plan. The model is meant to direct program development and create a comprehensive ecosystem health program by developing a complete cadre of people with ecosystem health educational skills, by directing educational courses or events at all levels of learning, and by having a significant influence at local, regional, national, and international levels.

EXPANDING THE SKILL SETS IN ECOSYSTEM HEALTH

Ecosystem health encompasses nearly all, if not all, disciplines. Some disciplines play a more vital role in ecosystem health than others, and some disciplines may be more interested than others. Given a program in ecosystem health, it is important to define which ecosystem health skill sets the teachers have and what skills need to be ac-

quired. There are three types of skill sets—expertise about particular subjects vital to the understanding of ecosystem health (ecology, sociology, health, politics, etc.), teaching skills (curriculum development, evaluation, educational research, informatics, etc.), and skills and attitudes that are key to the concept of ecosystem health (transdisciplinarity, comfort with uncertainty, etc.). Specific consideration needs to be given to identifying people within faculties and within universities who are interested in, and can participate in, the ecosystem health program. This interaction will provide both expertise to the ecosystem health program as well as important bridges to other faculties which, in turn, may lead to the spread of ecosystem health into other professional curricula such as law and business. Equally, this interaction may also lead to strengthening of those programs related to ecosystem health such as environmental studies, geography, sociology, and politics.

The transdisciplinary approach to problems is a good example of an attitude that is basic to the concept of ecosystem health. Developing the necessary team, the ground rules for team interaction and problem solving, and finding transdisciplinary solutions require special skills not commonly found in traditional institutions. It requires the willingness to “transcend” traditional knowledge (to “shed baggage”) and develop approaches that emerge from an intuitive approach based on a depth of experience in established fields. Similarly, there is a need for people to clearly embrace the concepts of uncertainty, surprise, risk, and the precautionary principle. These concepts, although accepted and understood by most ecosystem health practitioners, are not by many others. Moreover, teaching these concepts in faculties which emphasize certainty, predictability, and the ultimate truth in science, is, at the very least, challenging. Those teaching these concepts need to fully understand them, need to be able to provide a number of examples relevant to the learner, and need to have considerable experience in teaching these concepts. Professors in professional schools are generally very knowledgeable about the areas that they for teach. The same must be true for ecosystem health teachers.

Ecosystem health is an innovative program with great potential for an academic educator. Not only does bringing a person with educational skills into the ecosystem health fold provide the ecosystem health program with that expertise, but that person will come to understand what ecosystem health is all about and may become a strong proponent of the ecosystem health approach within their academic group. Having the expertise to provide a clearly

defined, well-delivered, well-evaluated ecosystem health curriculum is necessary to maintain and build the credibility of the ecosystem health program.

EXPANDING TO OTHER EDUCATIONAL LEVELS

Once an effective educational program is developed within a faculty, one must consider opportunities for students having taken ecosystem health to revisit the concept later in their careers. Reinforcing the concepts of ecosystem health after an initial exposure is critical to maintaining the commitment to ecosystem health. A one-time course that receives excellent evaluations does not necessarily result in a lifelong effect on how students view the world. Reinforcing the values and principles of that course at later stages in the careers of the participants is much more likely to result in behaviors and attitudes which encourage ecological health sustainability. Therefore, a priority after the development of a successful initial ecosystem health course should be to develop other courses later in the learning continuum—at postgraduate levels or at the level of practicing professionals.

Similarly, a successful ecosystem health program should engage students earlier in the learning continuum to promote ecosystem health earlier in the learners' lives. Evidence suggests that early childhood education has a profound effect on the acquisition of lifelong beliefs. Reaching out to the younger learners also provides an opportunity to promulgate ecosystem health concepts and potentially recruit students who support ecosystem health ideas.

A novel outcome of the professional level course could be the development and delivery of an ecosystem health module for high school or primary school students as a project for the course. Thus "see one—do one—teach one" is not only valuable for the primary or high school learner, it also requires that the professional student/teacher be able to effectively convey the concepts of ecosystem health.

EXPANDING BEYOND THE BORDERS OF THE INSTITUTION

In most instances, the professional ecosystem health program originates within a single faculty or within a single university. Once the program has become successful within this initial domain, there is ample opportunity to reach out

to other faculties within the university and beyond. Being available to other faculties not only provides those faculties with support for environmental programs, it identifies other human resources for the ecosystem health program.

The other way to reach out is to other universities which share the same ecosystem health values. This has the potential for developing shared programs with shared curricula, shared evaluation, and shared teaching methods. It also builds the credibility of the ecosystem health program nationally and internationally.

One also has to be mindful of the accrediting bodies and other national and international institutions which have a stake in professional education. The support of relevant professional associations and national accrediting bodies is critical to the acceptance of ecosystem health within the parent university and within the profession as a whole.

Creating interdisciplinary, interfaculty, and interuniversity alliances increases the potential for securing funding for ecosystem health programs. Increasingly, funding agencies are funding consortia rather than individual programs. Formation of such alliances not only strengthens the program academically but increases its ability to attract funding.

Finally, and perhaps most importantly, the program must be an integral part of the community to which it belongs. Partnering with the community can only build a program. The trust of the community in an ecosystem health program is crucial for the program to develop projects within the community in which students can participate. The support of the community is a powerful tool for changing curricula and can be the deciding vote in developing ecosystem health as a priority within an institution.

CONCLUSIONS

The future of our planet is tenuous at best. A series of disconnected attempts to address problems relating to economics, social justice, and the environment has not resulted in solutions which are critical to sustaining life on earth. Because we lack a perspective on the whole, there has been a marked deterioration in the health of the world's ecosystems and, indeed, the health of the planet. We urgently need a new perspective, one that places the "health of the land," in the words of the great American naturalist, Aldo Leopold (1999), first and foremost in our society.

Maintaining and enhancing the “health of the land,” or in today’s terminology, “ecosystem health,” is essential for human well-being. Better appreciation of concepts such as sustainability, the precautionary principle, uncertainty, and transdisciplinarity within the context of what constitutes ecosystem health, are crucial steps in reversing the degradation of the global commons. Ecosystem health education must be an integral part of all levels of education for all who contribute to our society, and therefore must be a key component of all professional curricula. To be effective, ecosystem health education must be delivered passionately and effectively. To do so, ecosystem health educators must learn new skills and adopt new attitudes. They must expand

their horizons beyond their specific programs to partner with other faculties both within their universities and beyond. They must foster the support and partnership with their communities. They must develop programs that continually reinforce the concepts of ecosystem health to all. Once these ideas are accepted and practiced, we can start to restore the health of our planet.

REFERENCE

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