

A NEW PARADIGM FOR ENVIRONMENTAL MANAGEMENT TEACHING IN UNIVERSITIES

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ABSTRACT

Equipping of students with skills of making thoughtful decisions on environmental issues is one of the fundamental goals of environmental education. However, the scope and the content of environmental management disciplines are not been defined properly as a systematic standard discipline. This implies the discipline is developing faster. Meanwhile, collaborative service learning is a new concept combining both traditional voluntary service with contemporary assignment requirements and standards with strong instructional component. This approach is much relevant to an academic discipline with professional orientation. Further, The Service Learning (SL) approach would open space for training students to develop their skills in application of knowledge into broader community.

This study applies the SL approach for data analysis. The study was conducted to compare environmental management study program of UCLAN, UK and RUSL, Sri Lanka and construct a model for improvement of environmental education of undergraduates based on Service Learning approach. Content of the discipline is conceptualized to a form of tree, leaving room for growth in all directions. Both universities have positive and negative situations and possess scope for improvement of the performance through SL approach. The paper also discusses issue on polarized nature in approaches of various stakeholders in higher education. The paper suggests integration of approaches in three types of stakeholders. Introduction of diverse degree programs based on same academic knowledge and differentiated based on professionalism is a satisfactory model for the purpose. SL approach is essential in providing professional skills and student centeredness is essential for both academic and professional courses.

Key words: Service learning, environmental management, university education

Introduction

Ultimate objective of environmental management is sustainable development. Economy of countries also must be changed to achieve sustainable development. The academics concerning sustainable development are laying groundwork for this needed "paradigm shift". The new sustainability paradigm will take shape as the dominant image of higher education (Clugston 1999). Equipping of students with skills of making thoughtful decisions on environmental issues is one of the fundamental goals of environmental education. (Joseph 2004). There are several common themes in becoming sustainable universities such as *sustainable physical operations, sustainable academic research, environmental literacy, ethical and moral responsibility, cooperation amongst universities and countries, development of inter-disciplinary curriculum, partnership with government, nongovernmental organizations and industry, and outreach* (Wright 2002). Curriculum revision of environmental management in universities needs to consider andragogic and transformative pedagogic principles. As Malcolm states (cited in Forrest & Peterson, 2006), that adult learners are self-directed, can contribute life experience, they are ready to learn, need the opportunity for immediate application, require a sense of information relevancy and are motivated when entering the learning environment (Millicent 2013). Research- teaching – learning nexus is increasingly important within the context of government policies and governance of post-secondary education (Day 2012).

In addition, collaborative Service Learning (SL) is a new concept combining both traditional voluntary service with contemporary assignment requirements and standards with strong instructional component (Millicent 2013). Further, most of the contemporary efforts of academics are oriented towards environmental initiatives rather than broadly defined sustainability. Moreover, disciplinary structure and economic forces drives academic disciplines to fragmentation and specialization (Clugston 1999). However, provision of up-to-date information about a spectrum of environmental issues from a variety of scientific disciplines along does not help to overcome many of the barriers to improve environmental decision making (Joseph 2004). Besides, In light of the 21st century requirements of higher education, relevancy and quality are to upgraded and environmental management programs are not an exception. Above consequences forms a requirement to conceptualize scope of the discipline, consider potential for application of service learning approach, and design methodological approach to assure quality and relevance of environmental management undergraduate programs.

Objectives

Above problem of defining study program framework would require development of a model integrating essential approaches to assure quality and relevance. Consequently, the general objective of this study is to design a model for improving relevance of environmental management degree programs through comparison of such programs in two different environments. The specific

objectives are to 1. Compare two different cases; and 2. Construct a model that integrates various approaches and provide framework for designing study programs.

Research Design

It is essential to look in to the study programs with a constructivist, pragmatic approach with principles of andragogy in order to meet the requirements of relevancy in skill development. Quality was then analyzed on the strength of documents available and relevant to the programs. Therefore, this study has focused on comparison of environmental management study programs in contrasting environments - developed country with the same of developing country, well establish program with establishing one and followed by a large number of students and opposite - , on the strength of their application of the SL approach. In this issue, pragmatic principles of John Dewey (perez 2000) were employed. The pragmatism of the application of Service-Learning approach was tested by its components: curriculum design process, opportunity for service learning, flexibility of the programs, providing interdisciplinary education, building team spirit, provision of professional skills, opportunity to solve real world problems, addressing job market requirements, and need for further training for employment.

The case study method (Eisenhardt 1989) was adapted for the study. Extensive literature was reviewed on the SL and other approaches to assess contemporary international experience. The primary data on the study programs were collected through review of program documents and structured interviews of academic staff teaching environmental management in both cases: Grenfell Baines School of Architecture, Construction and Environment in Central Lancashire University, UK and various concern academics in Universities of Sri Lanka. The interviews were primarily coded on ward content and then were coded to themes of SL components. Finally, content comparison was conducted with the all sources.

Results

This study presents various approaches to teaching / learning process, searched by means of extensive literature review, comparison of the nature of two selected study programs, and conceptualization of the discipline, the approach and the framework for integration of approaches in order to improve quality and relevance and that produced expected model for application. Achieving these two specific objectives resulted the primary objective of model development.

Approaches to environmental management teaching in universities

Traditional approach to higher education institutions was to prepare religious and civic leaders for colonial communities. Some researchers conceived universities as cultivating capacities for self-governance (Felten 2011). *Sustainability Framework approach* involves introducing various perspectives of sustainability for analysis and synthesis in classroom and group assignments. Students are provided with real life examples through guest lectures and providing opportunity for visiting the relevant organizations. The perspectives are: ecocentric, ecological modernization and neoclassical paradigms (Stubbs 2008). Extensive discussion on the performances of various originations is facilitated through student presentations and reflections on the same. Further students are given group assignments. Provision of sustainability framework with different perspectives was found more productive in terms of changing mindset of graduates (Stubbs 2008).

Most of the universities in teaching environmental management have adapted principles and themes related to moral obligation, sustainable physical operations, encourage sustainable research, and public outreach (Wright 2002). Out of 21 universities, all considered moral obligation as essential component in the management. Accordingly, moral obligation appears to be the most common principle adapted by universities for sustainable development. The second most common principle is public outreach (Table 1).

Table 1: Ranking application of sustainability principles by universities

Principles	Number of universities	Rank
Moral obligation	21	1
Sustainable physical operations	16	4
Encourage sustainable research	13	5
Public outreach	18	2
Inter-university cooperation	7	8
Partnership with government, NGOS and industry	11	6
Develop inter-disciplinary curriculum	9	7
Ecological literacy	17	3

Source: Designed after (Wright, 2002)

Service-Learning Approach is a common feature in environmental studies across various levels. Harold Ward studied sixteen educational institutions in US to understand the levels of using SL approach in their curriculum. Seven levels were identified and the approach was found to be used in 11 institutions in their “Upper Level Courses” (Table 2). The second in rank is shared by the “Consulting Model” and “the K-12 Partners”. In relation to universities, Upper Level Course and Consulting Model are worth

considering. Upper Level Courses that follow the consulting model in rank has particular interest. They include job descriptions, time lines, contracts and budgets. Cooperative environmental education programs of universities with schools have also a specific attention. Environmental internships are in the third in rank (Ward 1999).

Table 2: Significance of Service-Learning in various levels

	Introductory Courses	Upper-level Courses	Internships	Consulting Model	Non-credit Experience	K-12 Partners	Thesis
Number of Institutions	4	11	5	7	3	7	2
Rank	4	1	3	2	5	2	6

Source: Designed after (Ward, 1999).

Benefits to students from SL approach are several folds such as integration and validation, cooperation, confidence, satisfaction, motivation, sense of place, communication and effective combination. Further, the faculty, the university and the community are also receiving particular benefits from SL (Ward 1999). However there are several challenges in implementation of the approach. Effort of academics and the product reports may always not be valued on the contribution to personal and institutional performance in terms of marks or publication. Further, it is difficult to synchronize community needs and course needs and school teaching may find easier in this issue. And the common problem of evaluating team work to achieve individual grading is valid here too. Inquiry-based, problem based, and experiential community service learning are some of the other modifications to SL approach.

Nature of the study programs

Nature of study programs was analyzed in to its three aspects: *curriculum design process, opportunity for service learning and flexibility of the programs.*

In both cases, in UCLAN and RUSL, there is no any kind of barrier in the *curriculum design process* to apply SL approach in to study programs. The module contents are usually prepared by senior academics with specialty of relevant area of discipline and in UCLAN it goes through a discussion of the teaching staff, study board, review by external experts and the validation process of the university. In RUSL, though there is no such requirement for external review, the syllabus goes through the Faculty Board, University Curriculum Revision Committee, and The senate and if it is a whole study program – UGC for approval. Inclusion of SL is possible through one or several modules if the relevant staff wish to do so. Therefore, there is no any restriction in including SL to any of the university study programs.

UCLAN has a limitation as the module descriptor is a validated legal document and any amendment should go through the validation process while in RUSL only the syllabus has gone through the approval procedure. However, recent quality assurance requirements of Sri Lanka have also demanded for preparing descriptive course contents. Therefore, it is need to consider application of SL approach before preparing the module contents. The UCLAN *Module Descriptor* provides the information on specific nature of all assignments and learning outcomes and therefore there is no room for including an assignment not stated in the descriptor and this is a limitation for initiating SL between the review periods of four years. However, modern SL approach expects consideration of such activities through credited and validated assignments. It has been left to student initiatives. In this view, RUSL has better opportunity to apply SL approach.

Opportunity for service learning is expressed in terms of community engagement through the given modules. In both cases there is no any statement directly illustrate applications of the approach. However, interviews of UCLAN confirm that the broader community service is addressed in the context of work place module, student initiated module, residential field trips, and dissertation. The students are encouraged rather than having a planned program to perform a community service. It was expressed also that the students prefer taught causes and that application of SL approach is not sufficient. The UCLAN much values student independence and selecting such initiatives by themselves.

RUSL in this context do not show any of the support through the study program for engaging in community service, though the students themselves organize community services outside study programs as part of student union and society activities. These activities include services to homes for elders, remote schools and voluntary cleaning activities as an environmental service. The field classes organized to provide practical experiences usually do not involve a service to community; rather they are aimed at providing students a practical experience. The analysis show a greater potential for introducing SL approach to environmental management study programs in RUSL.

Flexibility of the study programs is expressed as opportunities to introduce SL activities by staff members without any changes to the validated documents. It was difficult to find any initiatives from the staff to launch such activity. Annual reviews and student feedback has not expressed a need for real SL activities. This situation was compared with other UK universities and found that the studies are limited and confined to high schools and to all traditional community service approaches (Field 2012). A similar situation was in Sri Lanka too. It was not possible to find any evidence of the use of approach in universities. Flexibility is limited not in the programs but of the staff willingness and engagement in both cases.

Provision of appropriate skills

Provision of appropriate skills was tested against the following themes: providing interdisciplinary education, building team spirit, provision of professional skills, opportunity to solve real world problems, addressing job market requirements and need for further training for employment.

Provision of interdisciplinary education is a compulsory condition for all environmental management study programs. The nature of the discipline itself provides such opportunity. This was evident from the documents of both cases and all respondents. This is a strong feature of the discipline where application of SL approach is justified. In other words, SL activities would provide essential experience for students who follow the discipline. However, provision of interdisciplinary education without SL approach is also possible. SL approach would integrate application of multidisciplinary education in to real world cases improving essential skills of students. Holistic approach to environmental problems is a concern of many academics and it would be realized through SL activities.

Building team spirit is one of the strong arguments of SL approach. Among all 39 environmental management related modules in UCLAN six contain group work in the methods of assessment. They are 1 group report with 50% weight, 4 group presentations with 20, 30, 60 and 60% weight in the assessment. A group practical with 20% weight is also included in one of the module. A case study is also included in one of the modules where both case study and the presentation carry 60% weight in the assessment. The module descriptors provide a sufficient range of opportunities and weight in assessment for building team spirit. However, two study programs – B A and B Sc in Geography- do not require those modules as compulsory and B Sc in Environmental Hazards requires two and B Sc in Environmental Management requires one. Accordingly, not all the degree programs assure team spirit of the graduates and all the group work assessments noted in module descriptors are summative. A better approach would be to provide team building opportunities through compulsory modules so that the provision of the skill is assured for all degree program.

Though the building team spirit is considered important by almost all academics in UCLAN, they have expressed various concerns about its application. Students like team work but do not like assessment based on team work. Consequently, team building process does not work upon expectations. It is also considered difficulties in assessing individual contributions to the group assignment. The case of 'free riders' was widely discussed. Some group members work well and achieve targets of the group assignment while other contributes nothing. Group discussions and debates on themes have successful stories. However, there was no trace of such assignments recorded in any of the module descriptors. In first two years, with large number of students' class assignments given to teams have produced good results. There were some experiments on group assignments such as giving a group assignment and provided a form where members themselves assess each other. In this experiment, outcome of the group work is assessed by the teacher and give marks to the group and the group should divide the marks among the members proportional to their contribution.

Reasons for unpopularity of the group work in UCLAN are explained in various ways. As the students work together for limited time, sometimes only in lectures, there is no sufficient circumstances for interaction. Further, they live in distant places and have different interests. One successful way of conducting group work is that the provision of group assignments in residential field trips where the students have sufficient time for interaction and time for quick preparation and to make presentations. It was found that those who work well in group assignments as group leaders to achieve goals perform well in their future career too.

In RUSL, team building has not been recorded as a need in any program documents related to environmental management teaching. However, the study guides, those are provided by the lecturers at the start of each semester carries some information on several types of group work. They are class room group assignments conducted mostly in early years with large groups, and in higher levels conducting projects by the whole small group with individual tasks, and organization of student seminar. These assignments are assessed with marks and sufficient room for team building is provided. As the assignments are noted only in the study guides, there is no such standard that each batch of students would have the same opportunity.

Assessment of team work in RUSL is also having the weaknesses as they are in UCLAN. The students like group work but not assessment. However in contrast, as almost all RUSL students resides in hostels or live in proximity, and therefore there is more opportunity for spending time for student interaction. Hence it is evident that students themselves organize group work in order to provide service to community. Homes for elders', remote schools and volunteer cleaning programs in public places on festival seasons are the objects of such student group initiatives. The faculty provides passive support to such programs and is an opinion that those should not be interfered as may destruct smooth movements. As a result such programs are neither monitored nor assessed under any academic program of the faculty.

Student initiations and opportunities for student interaction in RUSL provides better environment for introducing credited and appropriately assessed components of team work in to the study programs. Assessment methods are to be improved to reach student satisfaction. Though standardization through validated program documents were not able to achieve student satisfaction as in UCLAN, it is a basic requirement to make such activities to fit with intended learning outcomes of particular degree programs.

Relationship of group work with team spirit building has not been widely discussed at both UCLAN and RUSL staff interviews. It is needed to emphasize how group work synergize and create essential social need of the team spirit. A group of individuals may not achieve higher goals as it is possible through a team work. As the society works on social principles of production as a team, the degree programs too need to be oriented to build teams rather than promoting individualistic achievements. This need has been formulated in assessments of employability and personal development skills documents (Annette, 1999).

Provision of Professional skills demonstrates clear difference between UCLAN and RUSL study programs. Provision of six degree programs based on almost same scientific knowledge and differentiated by professions itself demonstrates UCLAN's orientation towards professional skills development. The next level is offering different professional type modules to different study programs. All four programs have modules with professional nature. That is a deviation from conventional teaching of academic discipline. BA (Hons) Geography program has 11 such modules and are offered in higher levels. B Sc (Hons) Environmental Hazards have the same number of such modules and only one is offered in the level four. B Sc (Hons) Geography has 13 such modules and more are in the higher levels. Highest number of such modules – 14 - is offered for B Sc (Hons) Environmental Management program. Further, there is a school requirement to state whether particular module is accredited by any external body. Accordingly, developing professional skills has been addressed sufficiently in the UCLAN program design and content.

The UCLAN academics strongly believe that professional skills could be impart through undergraduate environmental management study programs though the study programs need to be considered as academic qualification. Expressing the view by all respondent academics justified introduction of various degree programs branched out by professional modules. It was also emphasized that further the skills should be strengthening on job. The term professional skills were referred to a range of disciplinary and non-disciplinary skills. For example, preparation of CV was also referred to be a professional skill while industrial visits and river bank conservation planning and preparation of environmental audit report were also mentioned. However, the highest concern was that through academic study program, only fundamental professional skills could be imparted. The second concern was on the required financial resources. The perception is that the provision of professional skills requires a large amount and it is justified through graduate profile and employability. Professional skill performance evaluation includes work related assignments, report writing and presentations. Accordingly, UCLAN Environmental study programs are academic degrees specialized to a particular stream of professions.

Provision of professional skills through geography undergraduate study programs was a theme of debate in Sri Lanka from 1990s. This debate reflected on the nature of BA (Special) in Environmental Management study program too in RUSL. RUSL offers only one special degree program related to environmental management which comprises with modules of both academic and professional nature. There are two compulsory modules (course units) of professional nature offered in the Level 2 (second year of the study program). Another three such and non-compulsory modules are offered in the Level 3. In the final level (Level 4), there is a specialization in to five areas which are more professional nature. However, which modules are compulsory for a particular specialization has not been specified and students has the liberty to select a bundle of modules from those optional specialized modules as only two modules, namely project proposal formulation and dissertation are compulsory in this level. As a result, though there are a comparable number of modules with professional nature, the degree program has not focused to any professional stream leaving for broader scope.

Reason for indistinct definition of the focus of degree program in RUSL was clear from general perception of academic staff. Conventionally, these types of programs are of academic nature and there is no scope for discussion on a particular profession or professionalism in general. However, some of the academics argue on the need for improving societal need orientation of such programs as the societal needs have been evolved during the last half century. This argument faces difficulties owing to the background of the academics conducting the course. Except few, all the academics have only teaching experience and do not have professional experiences those are expected from the graduates. Addressing this drawback the management has taken measures to receive service of professionals from relevant fields as visiting lectures. This measure is not a stable one as program managers each semester defines required resources from outside and sometimes move away from the objective.

Analysis shows that there is a need for streamlining specializations of the study program in order to focus on various related streams of professions. The specializations would be expressed better by titles of several degree programs. Successful conduction of such programs needs involvement of professionals in designing and implementation of the curriculum. The number of academics with relevant industrial experience is needed to be increased. It would also be a better approach to look in to possibility of accreditation or liaise the degree programs with external bodies.

Opportunity to solve real world problems is another component of SL in imparting relevant skills among undergraduates. In UCLAN study programs, there are six modules that directly engage students with real world problems. Learning outcomes of those modules expect students to enter into real world to reach the outcomes. Some of those modules are of academic nature. For example, the second expected learning outcome of Biogeography is “*apply theories of Biogeography to real situations and recognize their shortcomings*”. The workplace Module of UCLAN is a good example of attending students to real world problems. Both learning outcomes of the module are of such nature “1. *Apply their specialist subject knowledge in an approved work context* and 2. *Use their transferable skills in a practical setting.*” hence, students possess sufficient space to engage with real world problems in the study program.

The mechanism of addressing the issue in the program was reviled in the interviews. The module leaders have the control in achieving the learning outcomes. There are various ways to bring students to the real world ranging from inviting industry people for interaction to providing work experience in the industry. Final level dissertation in most cases involves real world problems. In addition, there are *student product competitions* where students present solutions to real world problems. The students have sufficient scope for engaging with real world issues during their undergraduate studies under environmental management related study programs in UCLAN.

In RUSL two modules (course units) in their syllabi expresses a need of addressing real world problems. There is no clear learning outcome mentioned. Field classes, industrial training, invitation of industry experts and industrial visits are mentioned as opportunities to engage with real world problems. Some of such events are mentioned in the study guides, Field class and guest lecture schedules. However, there is no consistency in the offering of such opportunities through particular module.

Addressing job market requirements was a concern of the academics of both universities. Design of degree programs and modules and their content demonstrate orientation to develop some skills required by the job market in both UCLAN and RUSL programs such as GIS, Statistics, IT applications etc. Career guidance units provide some essential support for students. Major revision after each four years of the program content in UCLAN is a good opportunity to address such issues.

Academic staff of both study programs believes that the programs are academic and not professional. However, it is discussed that generic professionalism could be developed among undergraduates through developing soft skills and module related practical exercises. Therefore the degree programs do not assure preparedness to perform any particular profession or job, rather are prepared for range of professions.

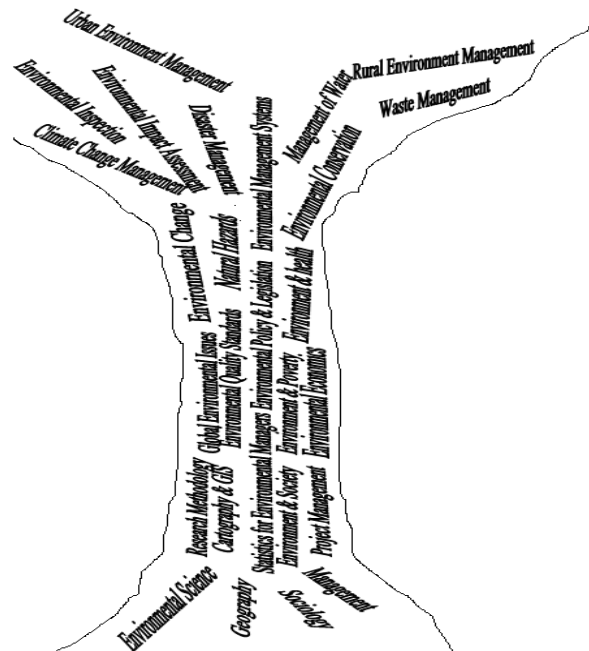
Conceptualization of the problem and the solution

This section presents result of conceptualization of the nature of environmental management discipline, problem of the orientation of curriculum design and implementation, and Integration of various approaches and framework for improving relevance of degree programs.

Environmental management Tree

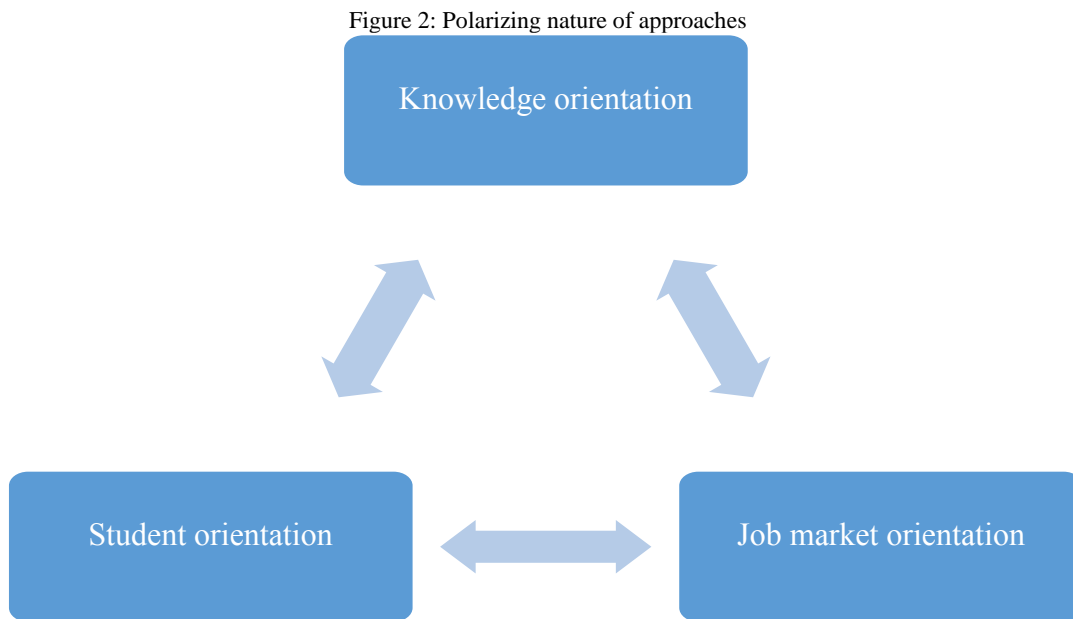
Attempt to conceptualize the discipline resulted a diagram form of a tree with its rooted disciplines of environmental sciences, geography, sociology and management. The discipline stems with various technical subjects including statistics, GIS, legislation etc. The branches are the areas of specialization having professional orientation. The advantage of the construct is that the content could be grown further with advancement of the discipline in all directions (Fig. 1).

Figure 1: Environmental Management tree



Analysis shows there are three approaches that repel each other in making decisions on environmental management teaching: knowledge, student orientation and professionalism. Above three approaches are seemingly polarizing in three directions. Different academics have different places in the three opposing categories. The academics arguing on *deep scientific knowledge* cannot agree with the *student centeredness* and the *professionalism*. Student centeredness does not agree with professionalism and deep

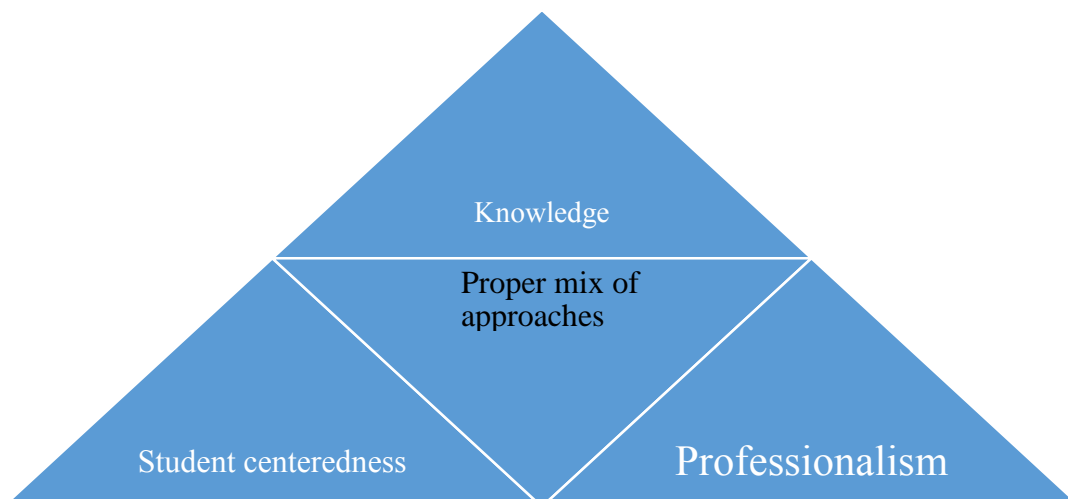
scientific knowledge. And those who believe thoroughly on professionalism cannot agree with deep scientific knowledge and student centeredness. We are dealing with a dilemma which needs pragmatic solution. This nature is shown in the figure2.



Integration of approaches

Integration of all three above polarized approaches is an essential process to meet contemporary and future societal demand for graduates. This study suggests a proper mix of all three approaches viz. Knowledge, Student Centeredness and Professionalism (Fig. 3). The diagram shows that all three approaches are equally important. The SL approach is also needs to be integrated with global trend to achieve required qualities of graduates.

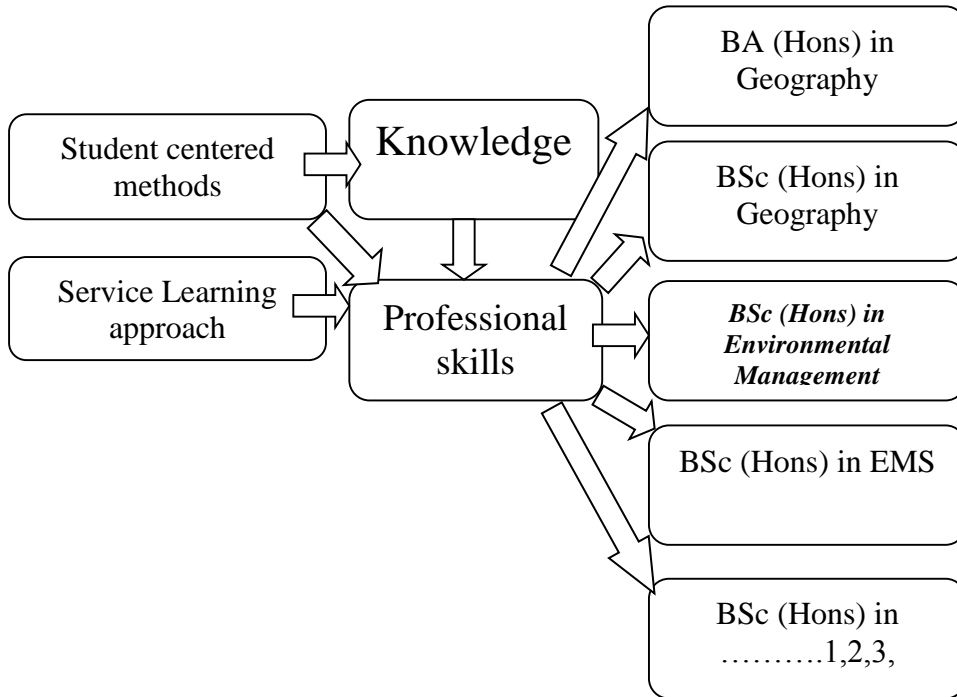
Figure 3: The integrated approach



The question is how these all four approaches to be integrated. Both knowledge and professionalism are outcomes and therefore mutually exclusive. It is possible to link all study programs by providing same knowledge base and separate them on the basis of required professionalism forming different degree programs. Then the modules with academic nature could be provided more in first levels and professional modules more in higher levels. Student centeredness and SL are approaches to teaching / learning methods and mutually inclusive. Therefore they can be used in combination: all modules are student centered and many

professional modules are both student centered and can apply SL concepts. Diverse degree programs could be designed on the basis of professional skills. The proposed model suggested by the study is presented in figure 4. Various degree programs to be designed to cater different societal needs thereby reducing the competition among graduates themselves.

Figure 4: Framework of proposed combinations for diverse degree programs



Discussion

Continuous education with periodical review by interdisciplinary group is an important aspect in keeping the quality and relevance of the study programs (Rodrigues 2014). This should be enriched with field work, inquiry-based and problem-based learning (Day 2012). Meanwhile, need for real projects, environmental engineering education and improving teacher student relationship are suggested for improving quality and relevance of study programs (Ghaffari 2013). Along with the scientific knowledge, indigenous knowledge would also be an object of environmental management for sustainability where such environment exists.

The study produces a construct for the discipline of environmental management in a form of a tree and a framework for integration of approaches to produce diverse study programs. Curriculum design for the discipline needs to focus on the framework as well as to consider periodical review, inclusion of inquiry-based and problem-based learning tools and mechanism to improve teacher student relationships.

Conclusion & recommendation

Achieving the first specific objective, literature survey and comparison of two cases prove that service learning approach is much relevant to environmental management teaching though there are three approaches with polarized nature viz. professionalism, student centeredness and knowledge centeredness. Further, with the second objective, the discipline is conceptualized to be a growing “tree” in all directions. Finally it is concluded that integration of relevant approaches and meeting quality and relevant requirements are possible through producing various study programs with the same base.

It would be possible to introduce several environmental management based study programs with similar nature of generic skills, attitudes and knowledge, with similar scientific knowledge and student centeredness and separated each other by the professionalism under the same benchmark statement. There would be slight variation in all components in various study programs. There are various needs of the society expected from a graduate of environmental management and all those expectations could not be considered by a single study program. Meanwhile, all those components are not expected from a single graduate. This would be justification for offering various environmental management study programs with the same basis.

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