

**Head note Chapter 8** Scholarly approaches to curriculum practice are critical to the success of undergraduate program reform. This chapter provides an integrated and stage-specific framework for re-designing, implementing, and evaluating learning-centred curricula in higher education contexts

## **LEARNING-CENTRED UNDERGRADUATE CURRICULA IN PROGRAMME, INSTITUTIONAL AND PROVINCIAL CONTEXTS**

Harry Hubball, Neil Gold

### **ABSTRACT**

*Universities, academic units, administrators, curriculum leaders and individual faculty members are facing considerable challenges in developing, adopting, and implementing program-level learning outcomes within undergraduate curricula. This chapter presents an integrated and stage-specific framework with guiding principles, and comprehensive strategies from critical lessons learned in Provincial, institutional and program settings in Canada.*

### **Introduction: Context for learning-centred curricula**

Higher education reform on an international scale is having a profound impact on organisations and institutions where there are now mandates and requirements to implement explicit learning outcomes and assessment policies for all undergraduate curricula (Bergen Communique, 2005; Bresciani, 2006; CRAC, 2003; Hubball & Burt, 2004; Hubball & Gold, 20007; OCAV Report, 2005).

Program-level learning outcomes are a central component of learning-centred curricula. Learning outcomes inform students what they can expect to achieve from a program of study so they can organise their time and efforts, and prepare for assessment; they connect segments of a curriculum, thus enhancing transferability of learnings; they communicate curriculum/program goals in a meaningful way to a broader community; they help to determine the extent to which learning has been accomplished; and, they guide faculty and administrators (within resource constraints), in part, to determine program(s) of study, course objectives, appropriate learning experiences, assessment and program evaluation strategies. Essentially, the learning-centred curriculum places emphasis on *learning communities, curriculum cohesion and integration, diverse pedagogies, clearly defined learning outcomes, and the scholarship of curriculum practice* (Barab and Duffy, 2000; Ewell, 1997; Gold, 1997; Hansman, 2001; Lave & Wenger, 1991; Wenger, 1998). The underlying assumptions about learning-centred curricula are that: representative students, faculty, and stakeholders in the broader context are active participants in the curricular reform process; that academic units are at different stages of curricular reform and will implement reform of curricula in diverse ways ; that learning-centred curricula focus on contextually-bound learning outcomes and integration of diverse pedagogies; and that learning outcomes focus on higher order and integrated abilities about what students are expected to know and be able to do (*e.g., demonstrate: critical thinking, responsible use of ethical principles, effective research, communication and problem-solving skills*) in the context of a field of study, and are designed to be assessable, transferable, and relevant to students' lives as workers and citizens in a diverse world (Baird, 1996; Bresciani, 2006; Clanchy & Ballard, 1995; Cox & Richlin, 2004; Erickson, 2002; Hubball & Poole, 2004; Hubball & Gold, 2007; Kanpol, 1995).

Learning outcomes, however, occur in many different contexts and at many levels which require careful integration and alignment in order to be realistically implemented in practice.

Thus, the localised development and declaration of program-level learning outcomes can be a major undertaking for most institutions and academic units. No matter how clear the arguments in favour of learning centred curricula, predicated on the establishment of program-level learning outcomes, for some, there remains a scepticism that can only be removed through convincing experience and the scholarship of curriculum practice (SoCP). Furthermore, addressing critical issues such as “how can learning outcomes be effectively implemented in our programme”, and “how do we actually know that students are able to demonstrate these outcomes on completion of our degree program” present significant challenges for many faculty members and administrators. - the magnitude of which may well be an outright deterrent for some academic units undertaking this venture (Drummond, Nixon, & Wiltshire, 1998; Kemp & Seagraves, 1995; Green, 1999; Shavelson & Huang, 2003; Schneider & Schoenberg, 1999).

This chapter presents a flexible, practicable and integrated framework for the development, implementation and evaluation of program-level learning outcomes in undergraduate curricula contexts. Guiding principles and comprehensive strategies are provided from critical lessons learned from the experiences and SoCP in Undergraduate Curricula, Institutional and Provincial settings in Canada.

### **Implementation contexts for program-level learning outcomes**

1) *Programme-level learning outcomes in the UBC Faculty of Pharmaceutical Sciences curricula.* The Faculty of Pharmaceutical Sciences at the University of British Columbia (UBC) includes 30 full-time equivalent faculty and 550 undergraduate students in a four-year B.Sc. (Pharm) Program. Within the Pharmaceutical Sciences program, there are five sub-disciplinary streams: Pharmaceutics, Pharmacology, Pharmaceutical Chemistry and Drug Metabolism, Clinical Pharmacy, and Pharmacy Practice. Students are required to complete at least one year of general sciences prior to admission to the B.Sc. program. Prompted by multiple factors, including professional program accreditation, and following extensive consultation and curriculum redesign efforts from 1998 to 2001, the Faculty developed and launched a learning-centred curriculum which focussed around critical graduation expectancies and a core set of nine program-level learning outcomes. This program is now in its fourth year of implementation. Through various long-term faculty development and stage-specific curriculum support strategies, including an eight-month *Faculty Certificate Program on Teaching and Learning in Higher Education*, table 1, in part, provides examples of how the ability-based learning outcomes were intended to connect to authentic methods of assessment and diverse learning modules within the redesigned 4-year learning-centred undergraduate curriculum (Hubball & Burt, 2004).

#### **Table 1. Ability-based Outcomes, Assessment Strategies and Learning Modules in the Four-Year Pharmaceutical Sciences Curriculum**

To ensure a well-designed and cohesive Pharmaceutical Sciences program, specific attention was paid to vertical and horizontal curriculum integration. For example, disciplinary-based ‘Working Groups’ were established to develop course streams over the 4 years of the program and integrate (vertical integration) the learning outcomes with appropriate learning experiences and assessment strategies within the sub-disciplinary field. Horizontal integration of knowledge and skills across the disciplines was co-ordinated by the curriculum committee and Chair by designing case-based learning modules (entitled Cases in Pharmaceutical Sciences, CAPS) which students take continuously throughout the four-year program (Adamcik, Hurley & Erramouspe, 1996; Albon & Hubball, 2004; Albon, Cancilla & Hubball, 2006; Beaudry &

Schaub, 1998; Brandt, Clements, & Piaskic, 1998; Hubball & Burt, 2007; Lockhart & Borland, 2001; Raman-Wilms, 2001).

2) *Institutional-level learning outcomes at the University of Windsor, Ontario.* In the broad context of educational reform, and in order to respond to the diverse needs and circumstances of students, faculty and the wider setting of University operations, an institutional visioning process sought to engage the campus community, through open-dialogue and various interactive forums to collectively define, develop, and implement notions of a learning-centred campus (University of Windsor Website, 2006). Integral to the institutional visioning process, all academic units on campus have been challenged to re-examine their curriculum and pedagogical practices in the context of the following institutional learning outcomes, expressed as demonstrable attributes for the University of Windsor graduate:

- ❖ the acquisition, application and integration of knowledge
- ❖ research skills, including the ability to define problems
- ❖ and access, retrieve and evaluate information
- ❖ critical thinking and problem-solving skills
- ❖ literacy and numeracy skills
- ❖ responsible behaviour to self, others and society
- ❖ interpersonal and communications skills
- ❖ teamwork, and personal and group leadership skills
- ❖ creativity and aesthetic appreciation
- ❖ a desire for continuous learning

Part of the community engagement process has been to invite visiting scholars with various perspectives, research and practical expertise in issues of curriculum development and pedagogy in higher education. For example, a curriculum consultant was invited to spend an intensive 3-day workshop and consultation series with Deans, Heads, Senate, Curricula leaders, academic units, and individual faculty members around campus. The consultant's role in this context was not to tell curricular committees how to re-design their curricula (neither would this have been possible, especially in terms of content). Rather, by working collaboratively with Senior Administration, Curricula Chairs, and individual faculty members, the role of the curriculum consultant was to understand the various learning contexts and to engage faculty with flexible frameworks and strategic approaches for developing, implementing, and evaluating learning-centred curricula. Three specific Faculties were targeted for special attention and additional workshop and consultancy support in order to champion best practices for learning-centred curriculum development. In addition, five curriculum leaders from various Faculties on campus were supported to develop further expertise in university curriculum and pedagogy by attending a specific eight-month *Faculty Certificate Program on Teaching and Learning in Higher Education* at the University of British Columbia.

3) *Provincial-level learning outcomes – Ontario Guidelines for Undergraduate Degree Level Expectations.*

Influenced by global higher education reforms to enhance the quality of undergraduate degree programs and recommendations from the Rae Report (2005) that every university in Ontario should implement the National Survey for Student Engagement (NSSE) in 2006-07, Ontario's Council of Academic Vice Presidents (OCAV) developed Provincial guidelines for learning outcomes and undergraduate degree level expectations for Ontario's publicly assisted

(n=20) universities (OCAV Report, 2005; National Survey of Student Engagement. <http://nsse.iub.edu>). Essentially, these guidelines require undergraduate programs to focus on the following learning outcomes: Students will be able to demonstrate ...

- ❖ Depth and Breadth of Knowledge
- ❖ Knowledge of Methodologies
- ❖ Application of Knowledge
- ❖ Communication Skills
- ❖ Awareness of Limits of Knowledge
- ❖ Autonomy and Professional Capacity

In light of the above guidelines for undergraduate degree level expectations, a series of workshops were established, primarily for the Ontario Council of Academic Vice-Presidents, to examine a wide range of strategic approaches for developing, implementing and evaluating learning-centred curricula in Ontario's diverse university contexts.

### **An integrated framework for developing, implementing and evaluating learning-centred undergraduate curricula**

Developing, implementing and evaluating learning-centred curricula are complex, multifaceted and iterative processes that cannot be treated as discrete and linear entities to suit all academic settings but rather must be carefully integrated in order to meet the diverse needs and circumstances of undergraduate programme contexts (Diamond, 1998; Fullan, 2001; Green and Kreuter, 1999). The following integrated and iterative framework has been applied successfully in Provincial, institutional and programmatic undergraduate curricular settings (Hubball & Burt, 2004; Hubball & Levy, 2004; Albon, & Hubball, 2004; Hubball & Burt, 2006; Hubball & Poole, 2004). This framework takes into account context, and integrates comprehensive strategies for learning-centred curricula. Essentially, this framework provides (i) a benchmark for an analysis of needs to determine the current status of curriculum within an academic unit, (ii) guidelines for direction and progression in the curriculum re-design process, and (iii) strategies for implementation and the SoCP.

### **Figure 1. *An Integrated Framework for Developing, Implementing and Evaluating Learning-Centred Curricula in Higher Education: Implications for Learning Communities, Planning, Assessment, Programming, and Evaluation***

Action research methodology is central to this integrated framework and SoCP. Action research methodology invites curriculum leaders to consider what research questions are important and provides authentic data on which to reflect upon and initiate changes to the effectiveness of program processes and outcomes (Bullough & Pinnegar, 2001; Gold, 1997; Thompson, 1996; Wolfe, Hill & Evers, 2006).

#### **(a) Undergraduate curriculum: Program development and implementation**

*Learning context strategies.* This is a critical component of learning centred curricula and refer to key implementation initiatives (*e.g.*, critical motivational factors for curriculum change, learning outcomes education, adequate support, leadership qualities, teamwork, representative input; responsiveness, incentives and sources of reward, and stage-specific curriculum support strategies) that empower the learning community, collectively and individually, to engage in the on-going process of implementing progressive learning-centred curricula (Barab & Duffy, 2000;

Cox & Richlin, 2004; Gold, 1997; Knight & Trowler, 2000). For example, in addition to understanding the unique context of a University, and those situational factors in which academic units operate, it is important to recognise a unit's current readiness, stage and progression with curricular reform;

*Planning strategies.* These refer to the development of global (overall curriculum) and specific (program-specialisation) learning outcomes (*e.g.*, acquisition, application and integration of knowledge; research skills, including the ability to define problems and access, retrieve and evaluate information; critical thinking and problem-solving; proficient literacy and numeracy skills; responsible use of ethical principles; effective leadership, communication and interpersonal skills) which, in part, drive the curricula, teaching and learning process (Baird, 1996; Lockhart and Borland, 2001);

*Assessment strategies.* These refer to the development of a range of methods (*e.g.*, capstone projects, portfolios, student presentations, exams) and procedures used to assess and evaluate student learning and curriculum effectiveness (processes, impact and outcomes) (Brown, Bull and Pendlebury, 1997; Diamond, 1998; Green and Kreuter, 1999; Shavelson and Huang, 2003);

*Programming strategies* refer to the development and integration (vertical and horizontal) of diverse learning strategies (*e.g.*, interdisciplinary/core learning modules, intra-program specialisation modules, and individual course work modules - learning technologies, problem-based learning, lectures, independent study and field experiences) in which students can acquire, integrate and apply knowledge in diverse settings (Poindexter, 2003).

## **(b) Undergraduate curriculum: Program evaluation**

The following program evaluation framework provides a broad and long perspective through which to investigate learning context, process, impact, and follow-up program evaluations (Fullan, 2001; Green & Kreuter, 1999; Kreber & Brook, 2001; Mills, 2000; Owen, Fletcher & Richards, 2001; Priest, 2001).

*Learning context evaluations.* These evaluations address key issues such as the intended audience for the evaluation, the objectives of the evaluation, and available resources to conduct specified evaluation projects. For example, learning context evaluations might include: comprehensive data gathering strategies for various stakeholder groups, researching relevant literature sources pertaining to learning outcomes in higher education, assessing perceived needs about program processes and outcomes, assessing critical factors in the development of localized learning outcomes, evaluating program feasibility issues, examining program cost-benefit issues, investigating issues around learning outcomes and student recruitment *etc.* What needs to be improved, why, how?;

*Process evaluations.* These focus on periodic assessments of issues of importance that arise throughout the program (formative). For example, to what extent are learning outcomes made explicitly clear to students? How do students best achieve learning outcomes? To what extent do learning experiences integrate learning outcomes? To what extent are learning outcomes reflected in course syllabi and program-level documentations? What are the strengths and weaknesses of program learning experiences? To what extent are learning context, planning, assessment and programming strategies integrated with learning outcomes at key stages of a 4-year program? What needs to be improved, why, how?;

*Impact evaluations.* These focus on issues of importance that occur as a result of a program (summative) evaluation. For example, what sorts of learning outcomes actually occurred as a result of this program? How do students demonstrate learning outcomes? To what

extent does the program meet, surpass, or fall short of the identified learning outcomes, why and how? What needs to be improved in terms of learning outcomes and program implementation? What needs to be improved, why, how?;

*Follow-up evaluations.* These focus on issues of importance which arose as a result of the longer term (*e.g.*, months, year) impact of a program. For example, as a student reflects upon the program and learning outcomes, what does he/she remember and value most? Generally speaking, to whom and to what extent, if at all, did the learning outcomes make any difference? If at all, how did the program contribute to the student's development as, *e.g.*, a pharmacist and citizen in a diverse world? If at all, can specific examples be provided about applications of learning outcomes to other academic activities? What were alternative or non-intended outcomes from this program?

The framework in figure 2, therefore, takes into account context and integrates comprehensive strategies for the development, implementation and evaluation of learning-centred curricula. Academic units, however, face considerable learning context challenges (*e.g.*, existing academic workload stress, traditionally low priority for curriculum leadership and contributions in tenure and promotion processes, curriculum fatigue, lacking localized expertise in the scholarship of curriculum practice) for developing, implementing and evaluating learning-centred curricula. Thus, considering curriculum revision as a staged process of transition that requires a period of significant and incremental adaptation rather than radical and abrupt change helps to alleviate faculty anxiety or resistance (Hubball & Burt, 2004; Kupperschmidt & Burns, 1997). Typically, academic units progress through cyclical and iterative stages of learning-centred curriculum reform. For example, *Pre-awareness Stage* (curriculum reform is not on the agenda nor is it a priority at all at this point in time); *Awareness Stage* (aware of groundswell of curricular reform in alternative settings though no real energy or resources committed to curriculum change); *Initiative Stage* (interest and commitment toward curriculum reform, initiate Chair and key personnel to spearhead process); *Mobilisation Stage* (mobilise and empower learning community for curriculum reform, establish curriculum committee, and sub-committee working groups for strategic planning); *Action Plan Stage* ('buy-in' readiness and integration of responsive outcomes, assessment strategies and learning modules developed); and, *Practice Stage* (on-going systematic analysis, refinement, further development and dissemination).

### **Stage-specific support strategies for implementing learning-centred curricula**

Various strategies from the above integrated framework have been very useful to assist academic units to progress through the stages of learning-centred curriculum reform. Generally, learning context strategies are especially important for developing a learning community and creating a 'critical mass' to address issues of learning-centred curricula during the *Awareness, Initiative and Mobilisation Stages*, whereas emphases on program development and evaluation strategies tend to be more relevant during the overlapping *Mobilisation, Action Plan and Practice* stages of curriculum reform. The following stage-specific curriculum support strategies have been particularly useful for assisting academic units to progress through each of the iterative and cyclical stages of learning-centred curricula reform.

- From *Pre-awareness Stage* to *Awareness Stage*

In the early stages, it is useful to encourage all stakeholders in the learning community to identify internal and external motivation (contextual) factors for curriculum reform (*e.g.*, via surveys, discussion forums, meetings), and to expose the learning community to a wide range of

resources, guest speakers and current literature pertaining to learning-centred curricula and best practices.

- From *Awareness Stage* to *Initiative Stage*

It is useful to build upon the above strategies with a view to identifying an appropriate and potential curriculum leader/chairperson who would be able to mobilise stakeholders through open-dialogue and various communications, and to spearhead the re-design and implementation of a learning-centred curriculum. To ensure that the curriculum re-design process is grounded in pedagogical research and best practices for program development, implementation and evaluation in higher education, the curriculum Chair might seek the assistance of an external consultant with appropriate expertise in the SoCP.

- From *Initiative Stage* to *Mobilisation Stage*

Typically, university faculties and academic units embrace several sub-disciplines, each with their own distinct sub-culture and perspective of the main discipline. Thus, from initiative to mobilization stages, it is useful to build upon the above strategies and to engage and mobilise a critical mass, collectively, and through disciplinary streams, in open-dialogue and needs analysis pertaining to the curriculum reform process. This is particularly effective through “Town hall” meetings (i.e., discussion fora about curriculum issues for faculty, administrators, students and professionals in the field), notice-board information about on-going issues and progress with curriculum reform process, individual and focus group interviews with faculty members, e-mail surveys and consultation with student and professional groups, and faculty development workshops on issues related to learning-centred curricula. This provides further networking opportunities to identify and recruit potential curriculum team leaders whom would be appropriate to mobilise personnel in sub-disciplinary specialisations.

- From *Mobilisation Stage* to *Action Plan Stage*

To ensure a well-designed and cohesive program among various sub-disciplines requires an overall shared vision and model of curriculum with specific attention to learning outcomes and vertical and horizontal curriculum integration. Vertical integration refers to coursework that progressively builds upon one another with each subsequent year of the program (e.g., from first to the fourth year), while horizontal integration refers to interrelated courses as a student progresses through each specific year of a program respectively (e.g., 2<sup>nd</sup> year courses). Vertical integration can be addressed by organising faculty members into specific groupings to identify and disseminate examples of innovative course design and best teaching practices within sub-specialisations. In addition, sub-disciplinary specialisations should be challenged to develop flexible, progressively challenging and responsive coursework (e.g., throughout years one to four of the program) in order to align and integrate learning outcomes with learning experiences and assessment strategies (Purkerson Hammer & Paulsen, 2001). Horizontal curriculum integration, is best developed, initially, by the Chair and curriculum team leaders in order to ensure that specifically designed courses (e.g., specific case-based, problem-based, project-based portfolio development, and/or field placement learning modules courses) provide unique opportunities for students to apply and integrate learning outcomes and course work experiences from the individual disciplinary streams to the solving of progressively challenging multidisciplinary

cases and problems throughout each year of the curriculum. It is important to emphasize that learning-centred curricular should not be over-loaded, horizontally or vertically, with rigid course modules. Rather, undergraduate programs require adequate flexibility to be able to respond and provide cutting edge learning experiences that originate from local and/or societal issues. Figure 2 provides an example for how learning outcomes, assessment and course learning experiences are integrated (vertically and horizontally) throughout the redesigned four-year undergraduate program in the Faculty of Pharmaceutical Sciences at the University of British Columbia.

**Figure 2. *A Model of the Learning-Centred Curriculum for the Four-Year Faculty of Pharmaceutical Sciences Program at the University of British Columbia***

Essentially, program-level learning outcomes are implemented throughout the four-year curriculum in the following four ways:

3. integrated case-based courses (CAPS) in each year of the programme attend to all 5 program sub-specializations and the nine ability-based outcomes. These courses not only draw upon the expertise and issues of the sub-disciplines but they also build upon one another in each progressive year throughout the program.
4. field placement experiences for students in years 2, 3 and 4 are specifically guided and assessed using the nine ability-based outcomes
5. individual courses within the programme are expected to address three of the nine ability-based outcomes
6. strategically placed learning portfolio modules in years 2, 3 and 4 require students to select and reflect on assignments throughout each progressive year in order to showcase their development in the nine ability-based outcomes

- From *Action Plan Stage* to *Practice Stage*

In order to progress from the Action Plan stage to Practice stage, academic units need to attend to all previous stage-specific strategies, as well as identify and disseminate best practices (e.g., innovative and integrated course work experiences) across the whole curriculum. Furthermore, a program evaluation team should be mobilised in preparation to address relevant research questions, gather appropriate data, and disseminate progress, critical challenges and plans for on-going refinements and investigations within the ‘whole’ curriculum and sub-specialisations. External assistance may be useful with regards to action research methodologies and the SoCP.

Table 2 indicates critical lessons that have been learned from experiences and the SoCP in undergraduate curricula, Institutional and Provincial settings in Canada.

**Table 2** *Developing, implementing and evaluating learning-centred curricula: Critical lessons learned in program, institutional and provincial contexts*

### **Conclusion**

Universities and academic units are facing considerable challenges in developing, adopting, and implementing program-level learning outcomes within undergraduate curricula. Learning-centred curricula takes time, collective energy and resources to fully implement. The

extent to which the learning community (i.e., the campus) is empowered, as well as the commitment of adequate resources (e.g., necessary levels of support for committee Chairs and curriculum leaders) and the power to influence people required during this process (e.g., appropriate leadership qualities, commitment, incentives and ability of curricular leaders to mobilise faculty and students), will have a significant effect on progress through the various stages of implementing learning-centred curricula. Furthermore, despite well-coordinated, innovative and strategic attempts to implement learning-centred curricula, it is unlikely to fully occur as intended due to the highly complex world of curriculum practice. It is not surprising, therefore, that inherent complexities in implementing learning-centred curricula can present significant pedagogical, as well as implementation challenges, for institutions and academic units in higher education. By implication, these challenges also extend to individual faculty who are required to re-examine their course design, assessment and learning strategies in order to meet the objectives of a learning-centred curriculum.

This chapter provides a useful integrated and stage-specific framework for implementing learning outcomes in various higher education contexts, as well as highlights critical contributions for the SoCP toward enhancing student learning. This framework takes into account context and integrates comprehensive strategies to assist academic units with re-designing and implementing learning-centred curricula.

### **About the authors**

Dr. Harry Hubball is an Associate Professor in the Department of Curriculum Studies at the University of British Columbia. His research interests focus on the scholarship of curriculum and pedagogical practice in university contexts. He has provided curriculum consultancy for Institutions, Faculties, Schools, Departments and academic units in diverse university settings. He is the Co-chair of the *UBC Faculty Certificate Program on Teaching and Learning in Higher Education*.

Professor Neil Gold is the VP Academic and Provost at the University of Windsor, Canada. He is a member of the *Ontario Council of Academic Vice-Presidents*.

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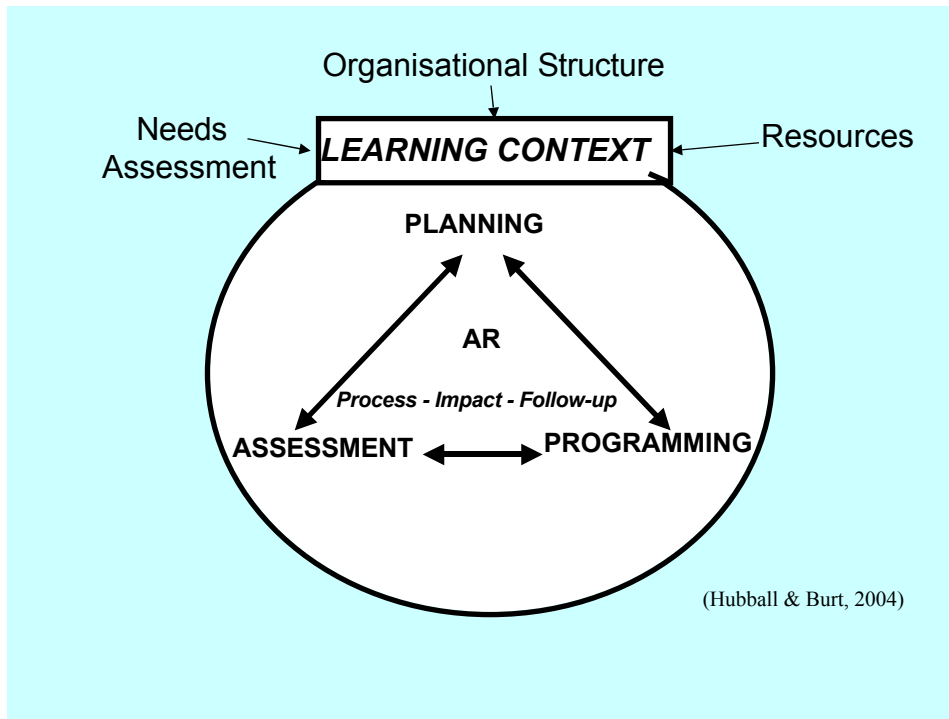
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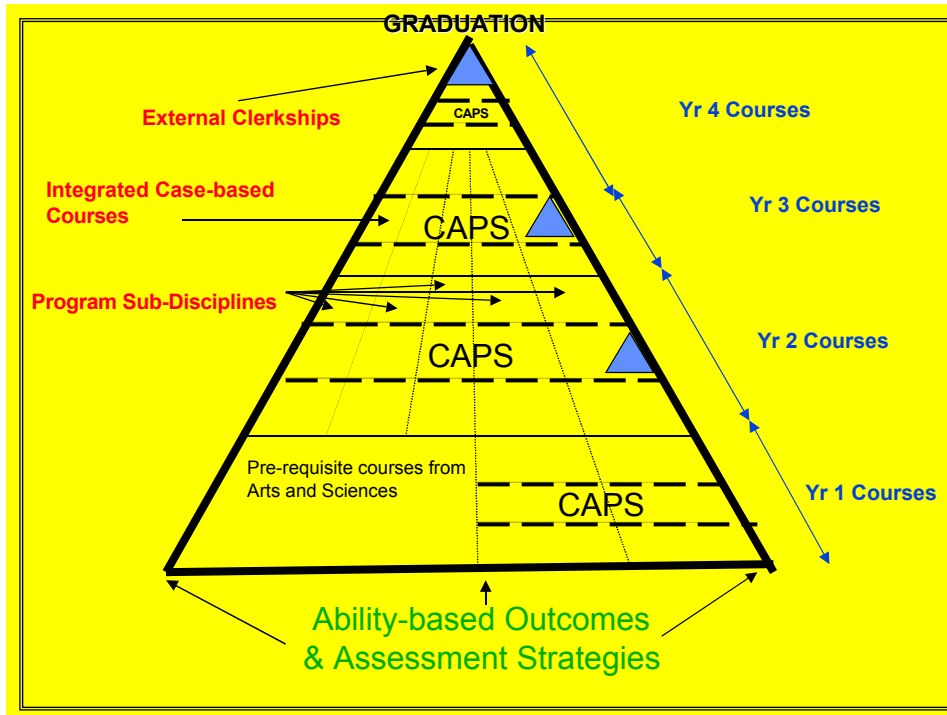
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**Figure 1.** *An Integrated Framework for Developing, Implementing and Evaluating Learning-Centred Curricula in Higher Education: Implications for Learning Communities, Planning, Assessment, Programming, and Evaluation*



**Figure 2.** *A Model of the Learning-Centred Curriculum for the Four-Year Faculty of Pharmaceutical Sciences Program at the University of British Columbia*

**Table 1. Ability-based Outcomes, Assessment Strategies and Learning Modules in the Four-Year Pharmaceutical Sciences Curriculum**

<b>Outcome</b>	<b>Assessment tools</b>	<b>LEARNING MODULES TO ADDRESS OVERALL ABILITY-BASED OUTCOMES</b>
1. Critical thinking	-In class, take home, exam cases -Written reports -Problem sets -Case presentations -Debates -Self, peer, assessment - Program Portfolio	<p style="text-align: center;">↑</p> <p><b>Problem-based Learning</b></p> <p><b>Web-based Learning</b></p> <p><b>Lectures</b></p> <p><b>Laboratories</b></p> <p><b>Practica</b></p> <p><b>Learning Portfolios</b></p> <p><b>CAPS (case-based learning)</b></p> <p style="text-align: center;">↓</p>
2. Information access and evaluation	-Library assignments -Critical review of literature -Debate of literature -Mini lecture	
3. Communication skills	-Written exams -Written reports -Oral presentations -Videotape counseling -Practical lab exams -Essays -Self, peer evaluations -Program portfolio	
4. Scientific inquiry	-Analysis of evidence and data -Laboratory results and reports -Written evaluations of literature	
5. Self-directed learning skills	-Program Portfolio -Quizzes, exams, reports, assignments -Self, peer evaluation -Case analysis	
6. Numeracy	-Quizzes -Problem sets -Lab reports -Assignments -Exams	
7. Interpersonal and teamwork skills	-Self and peer assessments -Program portfolio	
8. Ethical behaviour & social awareness	-Case studies -Portfolio -Self and peer assessments	
9. Apply and integrate knowledge	-Written cases -Written problems to solve	

**Table 2** *Developing, implementing and evaluating learning-centred curricula: Critical lessons learned in program, institutional and provincial contexts*

- \* Accreditation was the single biggest factor to influence the development, implementation and evaluation of learning-centred curricula.
- \* Strong (and adequately supported) curriculum leadership is required with the ability to engage the WHOLE learning community (including a critical mass within the sub-disciplines), through open dialogue and various communications (e.g., town hall meetings, faculty retreats, faculty meetings, notice board/website displays).
- \* Learning outcomes that are pre-determined and imposed from ‘top-down’ are typically met with significant resistance than are localized ‘bottom-up’ versions, which often result in similar, and easily aligned, outcomes.
- \* Guest speakers and external consultants with expertise in the SoCP in higher education can provide broader perspectives and best practice examples to assist the context-specific development, implementation and evaluation of learning-centred curricula.
- \* Development, implementation and evaluation of learning-centred curricula is a complex labour-intensive and relational process (much like that of effective teaching but on a much greater scale), therefore, realistic timeframes and adequate curriculum and faculty development support structures should be established in order for academic units to progress through the cyclical and iterative stage-specific processes of learning-centred curricula reform (e.g., The 8-month UBC Faculty Certificate Program began in 1998 and has enabled individuals and groups of faculty members, through various assignments, workshops and one-to-one tutorials, to focus on leadership issues pertaining to the scholarship of curriculum and pedagogical practice).
- \* The considerable time and effort required, individually and collectively, to successfully develop, implement and evaluate learning-centred curricula requires equal consideration for the varied contributions from faculty members within academic units Re: workload expectations, provisions for curriculum grant funding and award structures, as well as credit toward tenure and promotion processes.
- \* Provide additional support for select groups with early potential whom are likely to be able to show case and champion examples of innovation, leadership and integration with respect to learning-centred curricula.
- \* Development, implementation and evaluation of learning-centred curricula is an individual and social contextual process.