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Design and implementation of curriculum change

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Summary

In this paper, the authors propose adapting a four-stage model to design, implement and evaluate change in the curriculum for the degree of Doctor of Veterinary Medicine. For each stage, a relevant case study is presented to illustrate the application of the model. Factors facilitating change are described, as well as barriers to change. Strategies to overcome such barriers and the applicability of this model to other disciplines are also provided.

Keywords

Change model – Curriculum – Curriculum change – Doctor of Veterinary Medicine.

Introduction

A recent publication summarised multiple reports on education in the health professions, including veterinary medical education. Some of these reports addressed curriculum change (17). Of these, the report that generated the most discussion was the 1989 report, *Future Directions for Veterinary Medicine*. Its main theme was to, 'encourage needed change in US and Canadian veterinary medical colleges by helping them become more responsive to the challenges of environmental changes' (11). The American Association of Veterinary Medical Colleges recently published the Foresight Report. The following is a quotation from that report: 'To remain relevant to shifting new societal needs, veterinary medical education must prepare veterinarians for what might come in the future, not just for what can be seen now' (21).

Enhancing the Doctor of Veterinary Medicine (DVM) curriculum through curriculum review and renewal should be a continual process. Turnwald suggested such a review should take place every five to ten years (15). In support of curriculum renewal, two quotations seem especially relevant. In a commentary called 'Professing Change', which addressed veterinary medical education, Eyre stated: 'Maintaining the status quo is no longer an option. Merely attempting to stay where we are inevitably invites decline. In any progressive organisation, change is constant. Institutions must continually make improvements and seek new and innovative opportunities' (3). In 1998, Watson addressed the subject of changing an allopathic medical school curriculum: 'A curriculum is like

water, it has a tendency to seek the lowest level of energy it can reach, and without constant renewal, it will stagnate and become putrid' (20).

The following describes a model to aid in designing and implementing changes in the DVM curriculum, in part (e.g. public health), or in whole. For each stage, a brief case study is presented. The case studies are examples of strategies used in reforming the DVM curriculum at the Virginia Maryland Regional College of Veterinary Medicine (VMRCVM) (15). Factors facilitating the implementation of curricular change and barriers to such change are also addressed. To provide concise support from the literature, only references with major relevance to this paper will be cited.

Description of a model for curriculum design and implementation

While various models have been proposed to address curricular change and implementation (17), one adapted from a four-stage curriculum change process model developed by Walkington for engineering education (19) seems appropriate for the DVM curriculum. The model is depicted in Figure 1, with its four stages of:

- establishment
- dissemination
- design and development
- implementation.

A number of principles guide the model:

- change is a journey, not a blueprint; it is non-linear, loaded with uncertainty
- both individualism and collectivism have places within the process
- both ‘top-down’ and ‘bottom-up’ organisational strategies are required
- sustained success is obtainable only through connection with a wide community
- every person involved is an agent for change, with a variety of contributions
- curriculum changes require contextual change to be accepted and sustained
- evaluation is a necessary component of change (19).

Stage one: establishment

At this stage, the need for curriculum change is considered as well as the information needed to support the debate. Clearly, any case for change must be grounded in documented research and experience in content and delivery is needed, along with consideration of such things as the faculty history of receptiveness to curriculum change and implementation, and whether leadership and expertise are available to guide the changes. In addition, any case should consider the potential barriers to change (19). A wide representation of stakeholders is also needed at this stage. Information can be gained from ‘brainstorming’, literature reports, and surveys of stakeholders, based on the information required (19). The appointment of a core group of motivated faculty members is suggested for the

establishment stage; this group should seek contributions from a wide group of stakeholders (such as faculty members, appropriate staff, students, graduates, employers, etc.). The outcome of this stage is a proposal based on supporting documentation to present to the stakeholders (especially the faculty).

Case study

In the late 1990s, the chair of the VMRCVM Curriculum Board proposed the introduction of non-technical skills (business management, personal finance, communication skills, etc.) into the DVM curriculum and was informed that these skills were obtained as part of ‘on-the-job’ training after graduation. Following publication of the ‘Mega Study’ (2), which examined the economics of the profession, a retreat at the VMRCVM was held to address its findings. The retreat was attended by faculty members (including the Curriculum Board), VMRCVM staff and members of organised veterinary medical organisations, such as the American Veterinary Medical Association (AVMA), the Association of American Veterinary Medical Colleges and state veterinary medical associations. As a consequence of the retreat and data from the Mega Study, as well as from graduates and employers, as part of an outcomes assessment prepared for the AVMA Council on Education (COE) accreditation, the Curriculum Board recommended the introduction of four core credits and one elective credit of non-technical skills education.

Stage two: dissemination

This stage focuses on communication with all those involved in the change (particularly the faculty), to seek clarification and refinement (19). The proposal, presented in a variety of formats, such as a written report and/or presentation, offers the opportunity for faculty members and others to publicly share their fears and concerns, as well as to consider alternatives, and refine the proposal (19). Good leadership is essential at this stage, especially in dealing with the disagreements and conflicts which will invariably arise. However, tension and dispute can also produce positive options and ideas. Some faculty members and others may be unlikely to contribute in a large group setting, such as a faculty forum. For this reason, a mechanism needs to be offered for providing feedback in smaller groups, such as at a department meeting, or written feedback. Clearly, transparency is needed at this stage! The outcomes of the dissemination and refinement stage are:

- principles and directions for designing the changes
- a shared vision of the proposed changes, including aims and rationale
- broad principles on the course and curriculum development.

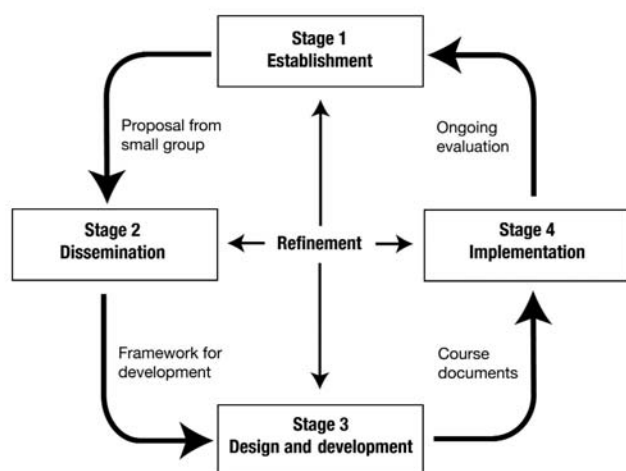


Fig. 1
Four-stage model of curriculum change
Adapted from (19)

Case study

Following the publication in 1989 of *Future Directions of Veterinary Medicine* (11), the VMRCVM conducted a series of retreats that discussed the suitability of the existing curriculum. The Dean appointed a task force, comprising senior members of the college, to undertake key tasks for the reform of the DVM curriculum. In turn, the task force formulated a set of goals to guide the process. Two significant goals were examining curriculum 'delivery', including the options of problem-based learning, and investigating the possibility of a core-elective curriculum. The report was presented to the Dean who then shared it with the faculty for discussions and seminars. Site visits were made to schools which conducted problem-based learning. Faculty members later voted overwhelmingly (80%) in favour of retaining the current (mainly didactic) approach to curriculum delivery and to adopt the core-elective model.

Stage three: design and development

This stage involves the development of the specific curriculum change to be implemented (19). Teamwork is not only encouraged, it is vital to achieve synergy, resulting from shared experiences and ideas. In addition, highly visible leadership at several levels is essential. The following is an edited excerpt of a list of people (compiled by Walkington) used in the design phase:

- core team members, to focus on managing the production of outcomes and co-ordinating 'writing' activities
- faculty members who will teach in the courses, working both independently and collaboratively to develop subject outlines through the organisation of content, selection of teaching and assessment strategies, and identification of specific resource needs
- technical, educational and administrative support staff for document preparation, library use, information technology and curriculum delivery support.

It is important that all roles, procedures, expectations and timelines are clearly communicated to everyone involved in the design stage (19). As time commitments to this stage can be extensive, it is important that the time spent by faculty and staff members is both recognised and rewarded in annual evaluations. The outcome of the design stage is a series of courses to be offered in the revised curriculum.

Case study

Following approval for a revised VMRCVM DVM curriculum, the task force, in conjunction with the Curriculum Board, reviewed each course in the first year of the curriculum through to the third year, making recommendations:

a) to retain or remove material, on the criterion of whether it was considered core or elective

b) on the proposed content and credit hours assigned to each course.

At all times, accreditation expectations according to the guidelines established by the AVMA COE were considered. Also considered were both external (academic as well as non-academic) and internal inputs on the content to be included in the new core curriculum. The result was a decision to remove approximately 25% of the content of the pre-clerkship curriculum. The proposed core curriculum was presented to the faculty for a vote: 75% were in favour of the proposal. In addition to core courses, two new types of courses were developed: track courses (areas of focus in a particular species or discipline, such as small animal, equine, food animal, mixed species, public/corporate), which are required courses for students in that track, and elective courses. Design teams were then formed to create syllabi for each course. These teams consisted of:

- a member of the Curriculum Committee
- the newly appointed course leader
- a faculty member from each academic department (Biomedical Sciences and Pathobiology, Small Animal Clinical Sciences and Large Animal Clinical Sciences).

Faculty petitions to add material to core courses or to request a change of credit were considered. Following approval by the design teams, the syllabi were presented to the Curriculum Committee for final approval.

Stage four: implementation and evaluation

This is the final stage of the curriculum change process. Although faculty members are the primary group involved in the implementation stage, the administration provides the budget for:

- physical plant (classrooms, seminar rooms)
- equipment and supplies (e.g. audiovisual equipment)
- laboratory and information technology support personnel
- appropriate animal resources, since this is a DVM curriculum.

It is important that the allocation of resources is managed effectively because excess workloads for faculty and staff, insufficient space and inadequate equipment, etc. will lead to frustration and waning support for the changes (19). Evaluation is a critical part of stage four, to determine if the changes implemented have met expectations and, if not, to provide data for refining the changes. Such evaluation

involves all stakeholders, including student perceptions, as well as the perceptions and experiences of faculty, administrative and technical staff, and employers (19). The perceptions of alumni and accrediting agencies can also be added. At the VMRCVM, accreditation is conducted by:

- the AVMA COE (every seven years)
- the Virginia Tech. Academic Review process (every seven years)
- the Southern Association of Schools and Colleges (every ten years).

The desired outcome of stage four is smooth implementation, adequate evaluation and, where necessary, fine-tuning.

Case study

Following introduction of the new DVM curriculum, each course was reviewed by a subcommittee of the Curriculum Board. This subcommittee consisted of representatives from the basic faculty (mainly years one and two) and clinical science faculty (mainly years three and four of the DVM curriculum), a student who had just completed the course and, where appropriate, a member of the laboratory staff supporting the course. The course leader used a structured report that included his/her perceptions of the course, course notes, assessments and results, student ratings of the course, etc. (15). The subcommittee considered the report and interviewed the course leader. In turn, the subcommittee provided a structured report that included recommended and, in some cases, mandatory changes (15). A report with mandatory changes invariably requires another review after the course is next offered. Other internal data included feedback from the surveys completed by graduating seniors every year. External data considered included student performances in the North American Veterinary Licensing Exam, as well as feedback from the surveys completed by alumni and employers every seven years, as part of AVMA accreditation. These data were discussed at Curriculum Board retreats and fine-tuning of the courses was recommended as necessary.

Factors facilitating curricular change

Factors facilitating curricular change have been described in many papers (5, 6, 7, 13, 14, 15, 20).

Leadership

While good leaders build high levels of commitment and resolve, ultimate success depends on discipline and the

right implementation framework. The good leader is adaptable, and therefore can navigate change successfully (8). Leadership, in its broadest sense, during all phases of curriculum change, is a key ingredient if such change is to be successful.

After the decision to embark upon curriculum change, leadership is needed at all levels (the Dean, the Associate Dean for Academic Affairs, department heads, task forces, the Curriculum Board and other committees, such as curriculum design teams and course leaders). Curriculum Board members must look beyond the needs of their department to the needs of the college. If curriculum content is to be determined by the faculty (the authors believe it should be), perhaps the most important leadership comes from the faculty providing the DVM instruction. Leadership at the Dean and department head level is required to provide overall guidance during the process, on such things as organisational structures, restructuring and retraining, if needed, communication strategies, budgeting and the necessary resources needed to support the change. In addition, such leadership is needed to recognise and reward faculty and staff time which has been invested in the change. Leaders, especially at the administrative level, must explicitly articulate the rationale for the proposed changes, keep faculty members involved throughout the process and make adjustments as needed to sustain a sense of faculty ownership and commitment to change.

It is important that leaders provide a transparent process without contradictory motives or hidden agendas. Leadership is needed to ensure that curriculum 'change' results in redirection rather than expansion, and that the change that occurs is not 'too much, too quickly'. Another acknowledged leadership technique is 'watchful waiting' to some forms of resistance or 'backlash'. With the passage of time, initial negative reactions to the change may dissipate as people acclimatise to the new order or discover that change is not as devastating as previously imagined (13). There may be a point at which watchful waiting needs to be replaced with administrative intervention.

Centralised management of the curriculum

Effective, centralised management can be valuable in preventing departmental territorial or 'turf' battles (15), since it can provide a broader view to departments that may be narrowly focused and competing for resources.

Collegiality and culture of the school

A strong sense of collegiality in a school will encourage the staff and students to favour doing what is in the best

interests of the future of the profession. A culture that places a high value on the DVM programme is also more likely to be interested in and willing to commit a significant amount of time to curricular change. Members of the Curriculum Board are the people who are most burdened with investing their time in a major curriculum change; they must be committed to this investment and share a common purpose if meaningful change is to be achieved.

Communication

Clear and frequent communication during all stages of curricular change is vital. Internal communication is needed to keep people informed. The communication is a shared responsibility of everyone involved, at all levels, from the office of the Dean through to committees and departments. Student members of the Curriculum Board should provide accurate and timely reports to their peers at class meetings. Opportunities should be taken to communicate with external stakeholders through such methods as electronic and hard copy news bulletins, state veterinary medical association meetings, and alumni reunions. The ultimate goal of communication should be to inform all interested people of and gain support for the proposed changes.

Small-scale changes

A small curricular change that is likely to be accepted may sometimes be helpful to gain or sustain momentum for a larger change. In adopting this strategy, it should be made clear that the small change is part of a larger strategy; otherwise faculty members may view the implemented change as being part of a 'hidden agenda' and are less likely to be supportive of the larger strategy.

Accrediting and licensing agencies

If changes in the curriculum are to be made, accreditation agencies, such as AVMA COE, and licensing agencies, such as the American Association of State Boards, are essential partners in the process and must be supportive of the proposed change.

Barriers to the implementation of curricular change

In any curriculum reform initiative, barriers to change can be expected (1, 3, 4, 6, 7, 9, 10, 12, 13, 14, 15, 16, 18). Below, the authors examine a few of those barriers that are

particularly pertinent to changing the DVM curriculum (Table I).

Table I
Barriers to curriculum change

Barrier categories	Barrier types
Lack of expertise	Knowledge and content
	Technical teaching
Lack of resources	Leadership
	Time
	Training opportunities
	Equipment
Lack of support	Budget
	Accreditation and licensing board requirements
	Discipline-based territorial or 'turf' ideas
	Collaboration and ownership
	'Buying in' by accepting involvement and change, 'watchful waiting'
	Anticipating and handling conflict, building relationships

Leadership

Lack of effective leadership can occur at any stage of the curriculum change process. Leadership is many-faceted. Specific barriers may include:

- a reward structure that values publishing research and generating teaching hospital revenue, to the detriment of curriculum change and teaching, is a disincentive to invest time in curricular change
- a lack of clear articulation of the vision and planning process
- a lack of supervision of the change process
- a lack of effective communication at any stage of the change process
- a lack of training (particularly when there is a change of teaching methods, such as moving to problem-based learning)
- a lack of funding for personnel, resources, equipment, etc.
- curriculum change that results in expansion rather than redirection
- change that is 'too much' and happens 'too quickly'
- a lack of ability to garner broad-based support for the proposed change
- the lack of a mechanism to address conflicts caused by curriculum change
- failure to make needed adjustments.

A change in leadership can have a devastating effect on curriculum reform if the new leader does not support previously approved or implemented changes. Therefore, a succession plan or shared-leadership model works best, if the change process is to be sustained over time. Curriculum Boards or committees are forms of leadership in this context and can either facilitate or become barriers to curriculum change.

Departmental structure

The traditional departmental structure does not necessarily foster integration or collaboration. Furthermore, within academic departments, faculty members are usually more strongly aligned with their own particular professional discipline than with the central mission of the academic community (12).

Accreditation and licensing

Accreditation standards and licensing laws reflect a conservative, conventional establishment, and accreditation has not always been in accord with the so-called norms (3). At present, the majority of State Boards of Veterinary Medicine do not allow limited licensure. One of the recommendations of the Foresight Report is species tracking (e.g. small animal, equine, food animal, etc.) within the DVM curriculum and limited licensure to practise veterinary medicine (21). Unless AVMA COE and the state licensing boards are supportive of these curricular changes, attempts to produce a DVM curriculum with extensive tracking may be doomed to failure if graduates are unable to pass the licensing exams.

Faculty inertia

An attitudinal barrier, faculty inertia may arise for a number of reasons. The value of preserving tradition is important on most campuses and change is not the natural vocation of those who have chosen an academic career (9). Moreover, an existing reward structure that favours research, as well as fear of loss of control, are diluting influences on academic power and autonomy (10). An example of loss of control is the introduction of a problem-based learning curriculum. Faculty members may demonstrate inertia by not volunteering to develop the skills needed to participate in a problem-based learning course. Others may volunteer to teach a course as a way of preserving jobs rather than as a means to improve the quality of the education offered to students (7).

Faculty members may also be overtly critical of curriculum changes, particularly if their courses have been curtailed (territorial or 'turf' issues). The attempt to preserve traditional ideas and approaches may be strengthened by inciting students, as an audience, to voice their displeasure. Examples of encouraging students to resist the changes can include making strong criticism of these changes, or referring to an 'experimental' curriculum. These comments are believable to students, who trust their instructors more than those responsible for making changes. Faculty members may also cite simple slogans, such as: 'Don't mend it if it isn't broken' (18). Slogans do not necessarily reflect what faculty members mean; they may be a way of dealing with unspoken fears about added responsibilities, lost privileges, etc. (18).

The four-stage model described in this paper does not simply comprise the four stages in themselves, but also requires that attention be paid to the principles of collaboration that support each stage and assist in addressing barriers. Nevertheless, barriers will be presented! Many of the factors facilitating curriculum change, described above, are also strategies to prevent or overcome barriers. In a recent commentary on 'Obstacles Associated with Organised Change', Graff (4) summarises with four suggestions:

- keep communicating the vision behind the change, and incorporate the responses to the change, as appropriate, into the overall change process
- delegate reasonable amounts of authority
- eliminate obstacles
- work with resistance; do not deny or ignore it.

Conclusions

Clearly, changing the curriculum is not for the 'faint-hearted' or 'thin-skinned'. It will always be confronting. Nevertheless, change that is well planned, articulated, supported and communicated can provide enhanced learning opportunities for DVM students as they prepare for their professional careers after graduation. Every context requires unique treatment; however it is believed that this model could be used for educational change in a range of disciplines in higher education. ■

La conception et la mise en place d'une réforme des programmes

G.H. Turnwald & J. Walkington

Résumé

Les auteurs proposent un modèle en quatre étapes pour concevoir, mettre en œuvre et évaluer la réforme d'un programme d'enseignement préparant au doctorat en médecine vétérinaire. Une étude de cas illustre l'application de ce modèle, étape par étape. Les facteurs propices au changement ainsi que les obstacles au changement sont successivement décrits. Après avoir proposé des stratégies pour surmonter ces obstacles, les auteurs examinent les possibilités d'appliquer ce modèle à d'autres disciplines.

Mots-clés

Docteur en médecine vétérinaire – Modèle de réforme – Programme d'enseignement – Réforme pédagogique.



Preparación y aplicación de modificaciones de los programas de estudios

G.H. Turnwald & J. Walkington

Resumen

En este artículo se propone un modelo de cuatro fases para preparar, aplicar y evaluar los cambios a introducir en el programa del doctorado en medicina veterinaria. La aplicación de cada fase del modelo se ilustra con un estudio de caso pertinente. Asimismo, se exponen los factores que facilitan los cambios y los impedimentos a su aplicación. Por último, se presentan las estrategias para superar esos obstáculos y la aplicación del modelo a otras disciplinas.

Palabras clave

Doctor en medicina veterinaria – Modelo de modificación de programas – Modificación de programas – Plan de estudios.



References

1. Bernier G.M., Adler S., Kanter S. & Meyer WJ. III (2000). – On changing curricula: lessons learned at two dissimilar medical schools. *Acad. Med.*, **75** (6), 595-601.
2. Brown J.P. & Silverman J.D. (1999). – The current and future market for veterinarians and veterinary medical services in the United States. *JAVMA*, **215** (2), 161-183.
3. Eyre P. (2001). – Professing change. *J. vet. med. Educ.*, **28** (1), 3-9.
4. Graff V. (2007). – Obstacles associated with organizational change. *J. vet. med. Educ.*, **34** (5), 628-632.
5. Green R., Dezendorf P. & Lyman S. (2005). – Infusing gerontological content into curricula: effective change strategies. *Educ. Gerontol.*, **31** (2), 103-121.
6. Guze P.A. (1995). – Cultivating curricular reform. *Acad. Med.*, **70** (11), 971-973.

7. Kanter S. (1991). – The implementation of general education: some early findings. *J. gen. Educ.*, **40**, 119-132.
 8. Miller D. (2002). – Successful change leaders: what makes them? what do they do that is different? *J. Change Manag.*, **2**, 359-368.
 9. O'Neil E.H. (1993). – Health professions education for the future: schools in service to the nation. Pew Health Professions Commission, San Francisco.
 10. Parsell G.J. & Bligh J. (1995). – The changing context of undergraduate medical education. *Postgrad. Med. J.*, **71** (837), 397-403.
 11. Pritchard W.R. (1989). – Future directions for veterinary medicine. Pew National Veterinary Education Program, Durham, North Carolina.
 12. Shugars D.A., O'Neil E.H. & Bader J. (1991). – Healthy America: practitioners for 2005, an agenda for action for US health professional schools. Pew Health Professions Commission, Durham, North Carolina.
 13. Steele D., Steyer T. & Nowalk A. (2001). – What did we learn about student and faculty 'backlash' to the interdisciplinary generalist curriculum project? *Acad. Med.*, **76** (4 Suppl.), S61-67.
 14. Swanson A.G. & Anderson M.B. (1993). – The ACME-TRI report. Educating medical students. Assessing change in medical education – the road to implementation. *Acad. Med.*, **68** (6 Suppl.), S1-46.
 15. Turnwald G.H., Meldrum J.B. & Sponenberg D.P. (2008). – DVM pre-clerkship curriculum reform, part I: a case study at the Virginia-Maryland Regional College of Veterinary Medicine. *J. vet. med. Educ.*, **35** (1), 91-101.
 16. Turnwald G.H., Meldrum J.B. & Sponenberg D.P. (2008). – DVM pre-clerkship curriculum reform, part II: directions and objectives of curriculum structure at veterinary medical and other health professions schools. *J. vet. med. Educ.*, **35** (1), 74-90.
 17. Turnwald G.H., Sponenberg D.P. & Meldrum J.B. (2008). – DVM pre-clerkship curriculum reform, part I: twenty-year literature overview of veterinary and allopathic medicine. *J. vet. med. Educ.*, **35** (1), 66-73.
 18. Uchegbu B.O. (2001). – Managing curricular change in the UWI medical schools. *West Indian med. J.*, **50** (4), 263-268.
 19. Walkington J. (2002). – A process for curriculum change in engineering education. *Eur. J. Engin. Educ.*, **27** (2), 133-148.
 20. Watson R.T., Suter E., Romrell L.J., Harman E.M., Rooks L.G. & Neims A.H. (1998). – Moving a graveyard: how one school prepared the way for continuous curriculum renewal. *Acad. Med.*, **73** (9), 948-955.
 21. Willis N.G., Monroe F.A., Potworowski J.A., Halbert G., Evans B.R., Smith J.E., Andrews K.J., Spring L. & Bradbrook A. (2007). – Envisioning the future of veterinary medical education: the Association of American Veterinary Medical Colleges Foresight Project, final report. *J. vet. med. Educ.*, **34** (1), 1-41.
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