Building the curriculum in higher education: a conceptual framework

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ABSTRACT In need for a common language and a tool stimulating a more holistic and long-term approach to curriculum development the Academic Development Unit of the KU Leuven developed a conceptual scheme to be used as a mindmap by all stakeholders working on curricula. Key concepts underpinning various views on curriculum development were identified from literature. Next different conceptions on curriculum design were evaluated against a set of usability characteristics resulting in the identification and visualisation of key elements describing the curriculum as a whole and the relationships between them. The scheme essentially emphasizes coherence and consistency between courses of a curriculum. Four quality circles represent several pathways to design, revise or evaluate the curriculum. The use of the scheme was evaluated in training sessions with program leaders and educational developers. The results indicate that the scheme is a useful tool to gain full insight in the complexity of the curriculum.

1 Introduction

Within higher education a curriculum or a program of study is a pivotal issue in the relationship between students, teaching staff and the university. However different stakeholders experience the curriculum (as a program of study consisting of several courses) from their point of view and are often only aware of a part of all important aspects building the curriculum. Therefore curriculum issues are complex to discuss with those different stakeholders. Clear and useful tools that describe all curriculum building blocks and their relationships can be helpful to stimulate all stakeholders to tackle educational issues taking into account the entire curriculum perspective.

Since 1977, the Academic Development Unit at the KU Leuven has a sustained effort to improve the quality of teaching in this research intensive university. During the first decades, academic development initiatives mainly focused on enhancing instructional design of individual courses to support student learning. For this purpose the unit developed a conceptual scheme (Elen 2002) which emphasizes the importance of coherence and consistency in instructional decision-making. This scheme is in line with worldwide practices used to support teachers in higher education (Wiggins and McTighe 1998; Biggs 1999; Fink 2003; Saroyan and Amundsen 2004). Throughout the Academic Development Unit’s own instructional development initiatives this scheme proved to be very useful (Elen 2002). It helps staff to develop a common ‘language’ and to focus on student learning, it offers them an ‘image’ to tackle course design issues. An important limitation of the scheme however was the lack of a curriculum perspective.

Around the millennium change, two governmental policy initiatives resulted in a shift towards more attention for curricula. Firstly, due to the Bologna declaration (1999) the KU Leuven curricula were reformed from a two - two or two - three years ‘Candidate - Licentiate’ structure to a three - one or three - two years ‘Bachelor - Master’ structure. Secondly, the higher education context in Europe provided universities with pre-determined learning outcomes, mainly to facilitate student mobility. Quality Assurance (QA) Agencies were established to recognize institutions and/or programs of study as having met these standards (Seto and Wells 2007). In Belgium this QA system was introduced in 2003, resulting in the accreditation of programs since 2006. From then on the Academic
Development Unit’s conceptual scheme on instructional design really met its limitations as there was no explicit link with the curriculum. The fact that each course is but one element in a learning process was not taken into account. However, it seems obvious that courses, being the ‘building blocks’ of a curriculum, need to be well-aligned in order to constitute a coherent curriculum, in order to meet the assumed learning outcomes.

The aim of this paper is to present a scheme that can be used as a mindmap by all stakeholders (teaching staff, students, managers, representatives of the discipline and labour market,...) involved in curriculum development. The starting point was the exploration of the literature on curriculum and its design. Firstly the key concepts that underpin various points of view on curriculum development were described. Then different conceptions on curriculum design were evaluated against a set of characteristics found to be essential to make the scheme easy to grasp and usefull in a discussion on the curriculum with and between its different stakeholders. This exercise resulted in the identification of the key components describing the curriculum as a whole and the relationships between them. Through the introduction of four quality circles in the resulting conceptual scheme, several pathways to design, revise or evaluate the curriculum were proposed. The use of the scheme was evaluated in training sessions with program leaders and educational developers. The results of this evaluation will be presented. Finally the limitations of this proposal will be discussed and approaches for further research suggested.

2 Key concepts for curriculum development

The term ‘curriculum’ used within the higher education context can mean different things to different groups (Barnett and Coate 2005; Fraser and Bosanquet 2006). Sometimes the curriculum is reduced to the structure and content within one course. In this paper the description of course and program that is made by Biggs and Tang (2011,113) is retained. So the focus is on aspects of curriculum development that go beyond those of course design and include all courses within one program. In this paper curriculum and program (of study) are in fact synonyms.

The curriculum as it is conceptualized in this paper is not a static description. On the contrary, it is a dynamic environment that cannot be grasped within one snapshot. It develops continuously due to environmental demands and contextual changes. Therefore to make the conceptual scheme useful in different contexts (e.g. designing, revision, experiencing) and for different stakeholders (teachers, students, policy makers, alumni,...) the curriculum is approached from different points of view.

2.1 Development of understanding

A first perspective taken into account was the vision of the curriculum as a place to develop understanding. Kelly (2009, 91) argues that outcomes of a curriculum should be defined in terms of intellectual development and cognitive functioning rather than in terms of quantities of knowledge absorbed or in terms of behavioural changes. He emphasizes the consequences for curriculum planning (Kelly 2009, 94): (1) rejection of the knowledge base for curriculum planning, (2) clear statements of the underlying educational principles or processes, and (3) education as a process of development. Discussing the curriculum in higher education should be about discussing the students’ learning experience as is emphasized by other authors (Oliver et al. 2008; Letschert 2004; Davis 2011; Litzinger et al. 2011). By incorporating the process of intellectual development student learning becomes prevalent.

2.2 Product and process approach
A second perspective taken is the focus on a process approach additional to the product approach. The product approach is initiated by Tyler’s (1949) rather mechanistic conceptualization of planning quality curricula by posing four questions: (1) What is to be accomplished? (2) What learning experiences will help accomplish the purposes? (3) How can these learning experiences be effectively organized? (4) How can the effectiveness of the learning be evaluated?

Stenhouse (1975) advocated for a process approach. He proposed to select content, develop teaching strategies, sequence learning experiences, and assess students’ strengths and weaknesses with an emphasis on empiricism: a process curriculum was designed to be not an outline to be followed but a proposal to be tested. Peter Knight (2001) also argues for a process approach by stressing the necessity of coherence and progression in a curriculum. He returns to Jerome Bruner’s concept of the spiral curriculum (Bruner 1960), saying “Bruner depicted a good curriculum as a spiral of repeated engagements to improve and deepen skills, concepts, attitudes and values, and extend their reach. The spiral curriculum has coherence, progression and, I claim, value” (Knight 2001, 371).

2.3 Planned, delivered, experienced curriculum

The final perspective is recognition of the difference between the planned, delivered and experienced curriculum (Prideaux 2003). What is planned by staff members for the students may differ from what is delivered and from what students experience or actually learn (Posner 1995). Therefore a continuous process of aligning planned outcomes with the delivered program and its confrontation with the experience of graduated students and alumni is necessary. This approach also serves to uncover both the hidden curriculum (unconsciously transmitted and received messages by instructors and students) and the null curriculum (what is not taught) (Eisner 1979).

3 Elements for a conceptual scheme

As a first step in the process of establishing the scheme the literature describing curriculum design within higher education was searched. The resulting frameworks (Davis 2011; Diamond 2008; Herring and Bryan 2001; Hubball and Burt 2004; Morcke and Eika 2009; Oliver et al. 2008; Prideaux 2007; Stark and Lattuca 1997) were analysed on meeting the following characteristics:

- based on scientific literature concerning (adult) learning theories, curriculum development, academic or educational development, instructional design;
- clarifying both the distinction and relation between curriculum development as a whole and design of individual courses;
- generic in its description of the curriculum so that it is usable for every discipline within higher education;
- be useful in the design, revision and evaluation of a curriculum;
- giving opportunities to every stakeholder (teaching staff, students, managers, representatives of the discipline and labour market,…) to discuss the curriculum from his own point of view;
- easy to introduce via a short presentation, a metaphor or a clear schematic representation.

All frameworks met at least some of the characteristics and were taken to the next step in the analysis. Because of the impact of accreditation on curriculum development, the quality criteria used in several accreditation schemes were also included (Stensaker and Harvey, 2006).
Four members of the unit having experience in curriculum development and quality assurance compared all components of the different frameworks. Similar components were aggregated into meaningful clusters, which were discussed until consensus was reached about their content and meaning. This work resulted in the following eleven elements for curriculum development:

- **The educational philosophy**: the description of the educational purposes and instructional philosophy that underlie curriculum decisions, reflecting the vision and mission of the institution - e.g. which learning theories underpin teaching and learning (Diamond 2008; Stark and Lattuca 1997; Oliver et al. 2008; Morcke and Eika 2009).
- **The positioning of the curriculum**: encompasses the level (Undergraduate, Bachelor, Master,…), orientation (strategic choices about content) (Diamond 2008) and the strategic choices about the disciplines involved compared to similar curricula at other institutes. For this element ample description was found in literature, but our own experience and context told us that introducing the 'level' actually helps stakeholders to discuss if their proposed program is most suitable to result in a Bachelor, Master or other degree. Moreover positioning its own curriculum against similar curricula regarding the disciplinary content enables to substantiate the choices made by the program.
- **The learning outcomes** at the program level: selection and integration of the knowledge, skills, and attitudes to be acquired by the graduates (Diamond 2008; Stark and Lattuca 1997). In accreditation schemes curricular outcomes are mentioned in terms of ‘results judged against targets’ (Stensaker and Harvey 2006).
- **Structure and sequence**: all courses are sequenced and structured together to form a coherent program of study (Stark and Lattuca 1997; Stensaker and Harvey 2006) with specific attention to vertical and horizontal integration (Hubball and Burt, 2004).
- **Learning, teaching and assessment strategies** should be tuned to the educational philosophy, should enable students to obtain the learning outcomes and should be aligned between courses (Stark and Lattuca 1997; Oliver et al. 2008; Stensaker and Harvey 2006).
- **The discipline, the research community, the labor market (with alumni) and the society** are all closely related to and influencing curriculum choices. It’s important to take into account e.g. the needs of employers and recruiters, the expectations of society, new findings of the research communities, the accreditation requirements and those of the disciplinary associations (Diamond 2008; Stark and Lattuca 1997).
- **Institutional resources** include facilities for teaching, organisational infrastructure and technology, quality and quantity of teaching staff, their experience and expertise, staff/student ratio and financial resources (Diamond 2008; Stark and Lattuca 1997; Stensaker and Harvey 2006).
- **Policy** includes departmental, institutional, regional, (inter)national regulation, organization and legislation (Stark and Lattuca 1997; Oliver et al. 2008).
- **Student characteristics** that need to be considered are student selection, characteristics of incoming students, diverse background of students (previous knowledge, experience or degrees, ethnic diversity,….) (Diamond 2008; Stark and Lattuca 1997; Stensaker and Harvey 2006).
- **Resources for students** include student guidance, student mobility and facilities for students/learning (Stensaker and Harvey 2006)
- **The individual courses** that together form the program of study (Prosser and Trigwell 1999, Biggs 1999, Ramsden 2003, Biggs and Tang 2011, Elen 2002).

Next an analysis was made on how these different elements are interrelated or influence each other, starting from the schemes of the papers discussed. In order to make the relationships visible and easily discussable, the elements were organized in a schematic representation as was seen in some of the other frameworks. Initially this was done by the four members of the Academic Development Unit, resulting in a proposal for the scheme.
Later this proposal was discussed with educational developers from within the faculties, a selection of program leaders and international experts on academic development in order to fine-tune the conceptual scheme (see Figure 1).

**Figure 1. Conceptual scheme for curriculum development**

The educational philosophy (1), the positioning of the curriculum (2) and the learning outcomes (3) constitute the ‘planned curriculum’, represented by a triangle box in the scheme. The three metaconcepts within are in close relationship to each other. The educational philosophy describes which learning theories underpin the choices in teaching and learning strategies to help student reach the learning outcomes. The learning outcomes are determined by the positioning or the scope that is chosen for the curriculum. The main box in the center stands for ‘the aligned curriculum’. The conceptual scheme for course design (Elen 2002) is placed in the middle of this box and is visualised in different layers, indicating that all courses are sequenced ((4) structure and sequence) and aligned ((5) learning, teaching and assessment strategies). They represent the most visible part (for every stakeholder) of a curriculum, the so-called program of study. Moreover the arrow between the main box and the triangle box indicates the ‘planned curriculum’ which is guiding how individual courses are designed and how the different courses are structured and sequenced and aligned to each other. These two boxes (top triangle box and main central box) are ‘owned’ by the department or the group of teachers that deliver the curriculum, meaning that they take decisions about the (re)design process. On top of the scheme, there is the block (6) representing the discipline, the research community, the labor
market (with alumni) and the society as a kind of advisory board. All these stakeholders are influencing (and influenced by) the choices that departments make in defining their position/profile, learning outcomes and educational philosophy (1), (2) and (3)). Besides the main box in the center, all organizational or managerial elements are represented that influence the way courses (11) are designed, sequenced (4) or aligned (5): institutional resources (7), policy (8), student characteristics (9) and resources for students (10). These components have to be taken into account by departments and program leaders in their curriculum decision-making.

4 Four circles for quality development of curricula

To cope with the complexity of working on curriculum related issues, four circles of quality development are proposed (A, B, C & D), which are closely interconnected. Going through all components connected by a circle enables their alignment. Changing one of the components will influence the other connected components. Going through the circles also means taking into account the perspectives and agendas of different stakeholders and searching for the best answer or compromise. This focus on change was partly inspired by the ‘paths’ described by Stark and Lattuca (1997), illustrating how evaluation and adjustment operate in their curriculum model.

A. The quality circle of the planned curriculum

By confronting the elements of the planned curriculum to the expectations of the influencing stakeholders, both new and renewed curricula can be planned or the plans can be evaluated. To plan or adjust a curriculum it is necessary to find out what the expectations from the labor market and society are for graduates in the discipline. Also the input from the associated research communities - being on top of the state-of-the-art knowledge - is essential. To position a program within the educational market it is necessary to compare the planned outcomes with equal or similar programs within the institute and abroad. The educational philosophy should be attuned to recent research on learning and teaching.

B. The implementation of a curriculum

This circle makes the link between the planned curriculum (A) and the aligned curriculum (C). It investigates the way the intentions are realized. In an empiric way the planned curriculum can be seen as a proposal that can be tested by gathering evidence on students’ learning experiences (Stenhouse 1975). Alumni can be asked if and in what way the planned learning outcomes were realized in the curriculum. In a similar way, faculty teaching in the Master program can appreciate the level of incoming graduated Bachelors. This circle focuses on the curriculum as a process (Stenhouse 1975). It is about how students experience the sequencing in the learning process and assess the (learning) strengths and weaknesses of the program of study. A curriculum map is a useful tool to demonstrate the link among learning outcomes and their realization in courses or course modules, learning opportunities and assessment. Curriculum maps allow identifying actual or potential deficiencies in the curriculum through consultation of different stakeholders.

C. The aligned curriculum

The aligned curriculum consists of all courses of the curriculum which are ordered in a certain sequence (in function of content and capacity building, in years or semesters or phases of time) and are structured in core courses (obligatory), in optional modules or as elective courses. This reflects a progressive curriculum (Knight 2001). Skills and attitudes need to be acquired through different courses with an ever increasing complexity. In a
coherent curriculum learning trajectories indicate how students transfer learning and deepen their understanding going from one course to the next. Alignment between courses is necessary to balance teaching, learning and assessment strategies in such a way that the intended learning outcomes can be realized (Litzinger et al. 2011).

D. The aligned course

This quality circle is reflected in the scheme for instructional design, which was first described by Elen (2002). As he mentioned it “is a general concept that promotes if-then reasoning’s” focusing the instructional design process on the constructive alignment (Biggs 1999, Fink 2003) of the different components of a course (learning objectives, learning activities, student characteristics, evaluation strategies, the learning environment and context). In an effective educational setting these components are coherently and consistently implemented and aligned to each other.

5 Actors acting on the curriculum

Although the scheme itself does not focus on the actors involved, several stakeholders are connected to the curriculum and integrated in the scheme: researchers, alumni, employers and the society are represented on top of the scheme. These stakeholders will be consulted on their ideas, experiences and needs when the planned curriculum is discussed by teachers and students. On the other hand alumni will, when employed, further explore innovations developed by research which they studied during the curriculum, in this way enhancing the society. Furthermore, students, faculty, teaching assistants engage in learning experiences throughout the aligned curriculum. They draw upon these experiences to rethink and optimize the planned curriculum (Oliver et al. 2008, O’Neill 2010). In this process of optimization, the role of the students is crucial: as they are the key actors in experiencing the program, their feedback on the different components and their relations is essential. Furthermore, program leaders and policy makers on all levels (departmental, institutional, regional, national, international) influence the planned as well as the aligned curriculum. They envision the contextual factors influencing the curriculum, manage the curriculum and plan and coordinate quality development initiatives.

6 Evaluating the framework as a tool to discuss the curriculum

The Academic Development Unit is verifying the face validity and the usability of the conceptual scheme for different stakeholders by using it in different educational development settings during the last four years. We have recently tested the scheme during a workshop on quality development of curricula where five program leaders and five educational developers were present (all from different disciplines). We concisely introduced the scheme and circles in a similar way as in this paper through a short powerpoint presentation. The participants were asked to analyse a curriculum related specific case or problem they were facing using the framework and they discussed their analysis with their peers. The different cases comprised revision as well as design and evaluation of curricula. They also made a SWOT analysis of the program they are coordinating or supporting in order to plan future development initiatives. At the end of the workshop, the 10 participants completed a short questionnaire on the usability of the scheme. The results are presented in the table below. All of the participants find the scheme valuable and consider applying the scheme implicitly in their work. Most of the program leaders and educational developers agree that the scheme represents how quality development of a program can proceed. However some of them disagreed and even most of them would not use the scheme explicitly in their work. The participants were asked to explain their answers when they scored ‘(strongly) disagree’. Three participants explained that the scheme lacked information on ‘how’ to implement it but they confirmed that it was a good framework for analysing the curriculum.
Table 1: Frequency table on the usability of the conceptual scheme

<table>
<thead>
<tr>
<th></th>
<th>Strongly disagree</th>
<th>disagree</th>
<th>agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The conceptual scheme is valuable.</td>
<td>6</td>
<td>4</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>The conceptual scheme represents how quality development of a program could proceed</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>I consider applying this conceptual scheme implicitly in my work?</td>
<td>5</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I consider applying this conceptual scheme explicitly in my work?</td>
<td>7</td>
<td>3</td>
<td></td>
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</table>

Eight participants also answered the question: ‘Did the workshop help you to develop new insights that can help you solve the case or problem you were asked to discuss?’ Three participants answered that the scheme is a useful framework to structurally analyse a problem, case or curriculum reform. One participant gained more insight in the challenges the program is facing. One participant indicated learning some new elements (alignment with educational philosophy, learning trajectories of research skills, teacher appointment as an institutional resource). Two participants answered they already had a good idea on the solution before the workshop. One of them mentioned having received some additional tips on how to solve the problem. Two participants indicated they did not gain new insights because they were already familiar with the scheme from earlier development initiatives of the unit.

Despite the small sample of key stakeholders that were involved in this usability test, the results indicate that the scheme is a useful tool to gain full insight in the complexity of the curriculum. However some of the participants expressed the need for additional information on how to implement the scheme and asked for a roadmap guiding them through the scheme.

7 Scenarios for curriculum development

As an answer to this need the unit is currently developing scenarios and exercises as an operationalisation of certain components and circles. In this way tools will be provided for program leaders and educational developers working on the curriculum. For example, in the case of a curriculum revision the following steps will be proposed:

1. Revising the existing learning outcomes by consulting alumni, labour market, research community, students and faculty
2. Mapping the new learning outcomes against the existing courses of the program (learning outcomes, teaching strategies, assessment)
3. Defining the learning trajectories throughout the curriculum
4. Discussing the gaps and overlap within one learning trajectory by teams of involved faculty
5. Make the necessary adjustments in the structure, sequence of the program followed by adjusting the content, learning outcomes, teaching strategies or assessment of individual courses

Each of the steps is translated in a scenario in which it is indicated which stakeholders should be involved, which specific steps need to be taken and which strategies can be used, what questions need to be answered and what the output of the exercise can be. These tools will be available to program leaders, educational developers, faculty and
students. They will also be additionally introduced in future development initiatives with program leaders.

8 Conclusions

The Academic Development Unit of the KU Leuven developed a conceptual scheme that creates a common language and serves as a mindmap for all stakeholders working on curricula. The results indicate that the scheme is a useful tool to gain full insight in the complexity of the curriculum. However, although the scheme is confirmed as being valuable as a mindset for program leaders and academic developers, the usability of the scheme as a roadmap for curriculum development is limited. Therefore, the unit is currently developing additional scenarios and exercises as an operationalisation of certain components and circles. These tools will be provided to program leaders and academic developers. In future research the unit will investigate whether providing scenarios and exercises additional to the scheme leads to an improved appreciation of the scheme. Moreover the usability of the scheme will be validated by a larger number of program leaders and educational developers and by other stakeholders (faculty and students).

References


Davis BW (2011) A conceptual model to support curriculum review, revision, and design in an associate degree nursing program. Nursing Education Perspectives, vol 32, no 6, pp 389-394


Eisner, EW (1979) The educational imagination: On the design and evaluation of school programs, New York: Macmillan


Fraser, SP and Bosanquet, AM (2006) The curriculum? That’s just a unit outline, isn’t it? Studies in higher education, vol 31, no 3, pp 269-284


Letschert, JFM (2004) *The art of curriculum development*. Enschede: University of Twente


Morcke, AM and Eika, B (2009) Medical faculty and curriculum design – ‘No, no, it’s like this: you give your lectures…’ *Medical Teacher*, vol 31, pp 642-648


