



CURRICULUM MAPPING AS INQUIRY IN HIGHER EDUCATION

Matete Madiba

INTRODUCTION

This chapter interrogates curriculum mapping (CM) as both a concept and a system and explores possibilities that can be associated with the different conceptualisations and the multiple purposes that CM can serve, with a special focus on curriculum analysis. The chapter aims to identify factors that have stifled curriculum development and analysis practices in higher education and seeks to present an argument on how these practices can be improved through the adoption of curriculum mapping. The argument is premised on work that spans over a decade, consisting of staff development and training activities; curriculum design, reviews and evaluation exercises; research into curriculum development and learning technologies; implementation of an institutional curriculum mapping project; as well as current research and development work to support an institutional curriculum mapping system.

Though curriculum mapping is a well-documented process (Udelhofen 2005), the paper-based approach is limited to supporting the dynamics of curriculum development and inquiry in higher education. The rich conversations that have to form part of such a process are lost in the tediousness and scope of the work to be covered. Advances in learning technologies provide new avenues from which curriculum inquiry can be explored. For example, using a web-based system for curriculum mapping can offer a number of affordances (Anderson 2004) and features to enable curriculum analytics. A system of this nature has to be built not as a technical tool; it has to be informed by institutional curriculum development agendas that are well thought through, as well as by internationally recognised curriculum principles.

By engaging in CM as a technology-enabled process, curriculum gaps and redundancies can be identified and informed decisions taken in terms of how to effect the necessary changes. Assumptions that inform curriculum designs are made explicit and rich and authentic conversations to interrogate those assumptions are provoked. An electronic trail of activities is maintained, providing the community with rich data sources from

PART THREE • METHODS FOR INTERROGATING, REVISIONING AND IMPLEMENTING CURRICULUM CHANGE

which further reflective practice can emanate. This reflective practice becomes a reliable mechanism to steer the teaching and learning agenda towards achieving desired outcomes, namely, student engagement, retention and success, curriculum and professional development. In the South African higher education environment in particular, CM creates space for moving the quality development discourse from the macro- to the micro-level to ensure that investigative lenses are placed at the coalface of teaching, learning and assessment. Furthermore, CM provides unique opportunities to wrestle with conceptual tools for curriculum development such as constructive alignment, cognitive demand, coherence, logical sequencing, credit allocation, and use of level descriptors beyond the training room. It provides opportunities to support an inquiry- and evidence-based approach to curriculum development, shifting the goals beyond compliance.

WHICH CURRICULUM SCRIPT PREVAILS?

How are conversations on quality teaching, learning and assessment initiated and sustained in a university? How do we ensure that university-wide conversations on good curriculum principles are promoted and translated into good practice? These are some of the questions to be asked in order to foreground the role that curriculum mapping can play in higher education.

Within the South African higher education sphere, the SAQA (South African Qualifications Framework) Act of 1995 led to many curriculum development training programmes and activities. Even with so many training projects, translating the principles that were implied in the act became a challenge. Taking staff to workshops did not necessarily yield the desired outcomes. Training was an isolated activity that did not mean transfer into practice. This is made more complicated by the fact that curriculum development has many layers. How does one successfully traverse the many layers, from the exo- to the macro-, the meso- and the micro-levels and successfully weave in all the intended quality principles? How do role players manage the transition from curriculum development to delivery, work across all the many processes involved and still ensure that there is quality teaching and learning at the end? To demonstrate the challenges implied here the latter question can be posed differently: Which curriculum script prevails; will it be the intended, the planned, the taught, the learned or the assessed? What about the many discrepancies in between? Curriculum mapping, both as a concept and a system offers a number of opportunities to wrestle with these types of questions and more.

A key assumption made in this chapter is that curriculum mapping offers opportunities to approach curriculum as a “living system”, to use Wadsworth’s (2010:19) words as she argues that research and evaluation should be seen as “processes of inquiring within living systems”. Wadsworth (2010) argues that human inquiry has passed through three eras already, from research to evaluation to quality improvement. She

CHAPTER 19 • CURRICULUM MAPPING AS INQUIRY IN HIGHER EDUCATION

poses a challenge to move towards the fourth era that she describes as doing inquiry within a “living systems approach”. She further argues:

Thus the attempt to increase ‘whole systems’ capacity to fully search ‘around the inquiry cycle’ might be enhanced also by building up and strengthening everyday and in-house inquiry by individuals and groups: creating spaces and places for everyone to be able to stop and reflect, think and theorise, envision and plan, and try things out (Wadsworth 2010:58).

An accompanying assumption is that curriculum mapping can help build capacity and create these *spaces and places* for teaching staff to deliver curriculum in an inquiry-based manner and thus make research, curriculum evaluation and continuous improvement of teaching and learning an ongoing reality.

THE MANY LAYERS AND LEVELS OF CURRICULUM DESIGN AND DELIVERY

It is useful to first identify a meaningful framework within which curriculum is to be developed in an institution. Part of this is to acknowledge the many layers as already alluded to. Such a framework should help identify what imperatives should inform curriculum at each level. Strategies and methods of how external information (the *exo-level*) is collected and analysed to inform the design of new programmes are not fully developed and in many cases result in programmes with a narrow focus. The macro-level has received some attention, given the SAQA registration processes. What has crippled many curriculum development projects in South African higher education is concentrating at this level only and stopping there. The SAQA template that mainly results in a programme description document has been used as the main tool to facilitate curriculum development training. Though there is not much that this description will say about the actual teaching and learning, it is supposed to provide a sound basis upon which decisions on what to teach should emanate. A look at the programmes registered on the SAQA website provides a picture of the state of affairs in this case, a picture that is not by any measure pleasant to look at. There is a need to improve capacity in producing programme descriptions, the reason why the implementation of the Higher Education Qualifications Framework (HEQF 2007) should move beyond compliance.

The meso-level mainly resides in yearbooks and these contain general information and regulations governing curricula. The meso-level is the home for the many rules and regulations that govern course selections and combinations. Before the advent of SAQA, higher education curriculum was mainly available to students and the public in this format, and it was a record of the content and subject matter (titles and topics) to be learned in relation to specific programmes. It is only with the SAQA act and its aftermath that the macro-level was formally introduced. This became the main focus in terms of curriculum development from the late 1990s until recently. Improvements at the meso-level should facilitate students’ understanding of how the curriculum is packaged, and guide the processes of how they need to build learning programmes

PART THREE • METHODS FOR INTERROGATING, REVISIONING AND IMPLEMENTING CURRICULUM CHANGE

for themselves that will lead to meaningful qualifications. A second challenge is to create sound links between the exit level outcomes that appear in the programme description and the content to be taught and learned. This part has not proved to be an easy one.

The micro-level has not enjoyed much attention and is left in the hands of teaching staff or lecturers, and perhaps that is rightly where it belongs. The challenge becomes bigger when this level is made less transparent and accessible and where continuous improvement becomes a threatened project. The focus on programme description and its components compromised the focus on what really goes into teaching and learning. A significant level of fragmentation remains, where programme descriptions are far removed from what is actually planned for and executed in the classrooms. This caused both the institutional audits and programme accreditation in the first cycle of the Council for Higher Education (CHE) not to have the desired transformative effect on teaching and learning in the South African higher education. It then became necessary that in the second cycle the object of analysis and focus becomes different and moves as close as possible to the micro-level. The CHE (2010:11) has already announced that

the second cycle of quality assurance will be focused on teaching and learning, particularly on the promotion of quality teaching and learning at all institutions and providers of higher education. This will be given effect differently through each of the quality assurance tools used by the HEQC according to their specific purpose and scope.

It is evident that focus at the micro-level must not be achieved at the expense of the macro-level. It is within this context that curriculum mapping is seen as a means to create the necessary links across all the levels and to ensure that the necessary relationships are maintained. The system can provide a constant mirror to check if these links are maintained.

WHAT IS CURRICULUM MAPPING (CM)?

Susan Udelhofen (2005) traces the concept of curriculum mapping back to the 1980s and associates it with the work of Fenwick English. English, an American educational author in the field of curriculum management and auditing, defined the concept as “a reality-based record of the content that is actually taught, how long it is being taught, and the match between what is taught and the district’s assessment program” (Udelhofen 2005). As Udelhofen (2005) points out, the concept was broadened in the 1990s through the work of Heidi Hayes Jacobs, especially through two of her books, *Mapping the Big Picture* (1997) and *Getting Results with Curriculum Mapping* (2004). The original definition was not only broadened; the concept was turned into “a multiphased process” (Udelhofen 2005).

The concept has evolved to incorporate many other facets associated with curriculum. Originally, as implied in English’s definition, it was only used to record and compare

CHAPTER 19 • CURRICULUM MAPPING AS INQUIRY IN HIGHER EDUCATION

the actual and taught curriculum with the assessed. Because of the many advances in technology the concept is now transformed into a dynamic system that can be used to compare all the possible *hues and shades* that can result from the intended curriculum. Moving curriculum mapping from the paper-based into a technology-enabled environment has made the definition even more unstable; new ‘affordances’ that come along with the latest developments in technology keep on expanding the possibilities of what can be achieved when the concept is embraced into curriculum development practices. For example, the latest developments in data mining have given birth to curriculum analytics. Analytics is basically about using available data and mining it intelligibly to inform decisions (Online Analytics 2010). According to Educause (2010), “[a]nalytics tools provide statistical evaluation of rich data sources to discern patterns that can help individuals at companies, educational institutions, or governments make more informed decisions”. When applied to curriculum, it means collecting curriculum data and using it to enrich conversations (on curriculum) and to inform decisions on changes to be made. Following Pawson’s (2006) evidence based approach to policy development, implementation and evaluation, the CM system can provide evidence beyond statistical data to inform and improve curriculum related policies, praxis and evaluation tools in a university.

In the context of this chapter curriculum mapping is seen as both a concept and a system through which ongoing reflection and continuous improvement of curriculum in an institution can be enabled and supported. The process of curriculum mapping involves the loading of curriculum data into an electronic platform. The platform takes advantage of the affordances brought about by the latest web-based technologies and functionalities to enable the analysis of curriculum. As a system it becomes part of the (cyber)infrastructure⁸⁴ to support an inquiry- and evidence-based approach to curriculum development and to instil a culture of asking questions about what is being taught, learned and assessed, including the why and how. CM becomes a process by which relevant role players (such as teaching staff, coordinators and educational developers) document the curriculum associated with programmes and modules from exit-level outcomes that appear in programme description documents to content, teaching plans, assessment plans and resources utilised; in other words, from the exo- and the macro- to the micro-level.

It is in this process of documenting where space for rich conversations is created; and where questions emanate about the what, why and how of what is being taught, learned and assessed. The process does not stop with documentation. Documenting the curriculum sets in motion the next step – which is curriculum analysis – to help arrive at judgements that either validate what is documented or suggest the necessary changes to be effected. By engaging teams in creating curriculum maps at different

⁸⁴ The driving engine for the Information Age is *cyber infrastructure (CI)*: the organised aggregate of information technologies (computers, storage, data, networks, scientific instruments) that can be coordinated to address problems in science and society (Berman 2008).

PART THREE • METHODS FOR INTERROGATING, REVISIONING AND IMPLEMENTING CURRICULUM CHANGE

levels of curriculum design and development a platform is created for discussions and debates to occur and to create room where sound rationale is built for choices made in shaping curriculum. Curriculum mapping as a practice enables the community to record the decisions that are taken in the process of curriculum development and delivery, and the monitoring and evaluation of these decisions.

When curriculum mapping is adopted as a process and project in the manner alluded to above, the overall aim is to develop the conceptual as well as the technical infrastructure that will enable and deepen institutional conversations as far as curriculum is concerned; and this is done on the premise of continuous improvement of teaching and learning and curriculum delivery. Curriculum review, renewal, transformation or even revolution is an item that is consistently high on the higher education agenda, both nationally and internationally. The April 2010 Higher Education Summit at the Cape Peninsula University of Technology concluded its recommendations by stating that we need a curriculum oriented toward social relevance and which supports students to become socially engaged citizens and leaders. Equally, at the April 2010 Universities and the Millennium Development Goals (MDGs) conference of the Association of Commonwealth Universities' executive heads, universities were urged to regularly review curricula to ensure graduates had the skills and attitudes to contribute to attaining the MDGs and sustainable development. Curriculum mapping, if well conceptualised, holds promise to deliver in this regard. It can create a platform from which to confront the heart of the matter as far as curriculum delivery is concerned: the worth, weight and quality of being graduated.

The following demonstrates a few of the possibilities in such a system. The questions to pursue might be: Where in the university is anything to do with HIV/AIDS taught? What learning materials exist within the university and how can those be shared? Pushing it further, another question might be: What learning objects exist within the university that can be associated with the topic and how are they used? Two more questions might be: What teaching, learning and assessment strategies and methods are used in teaching this topic across various units, modules and programmes? Which exit level outcomes are associated with such a topic? To explore these questions using a system of this nature one is at the mercy of how well the system is built, and the quality of the data loaded. Here are screenshots of how such an inquiry might develop: The search button is a useful start where a key word related to an area in which information is needed can be typed. If such a word is AIDS, given the data has already been loaded and how the system is prompted, the results can be seen in Figure 19.1.

Figure 19.1 shows which programmes contain the search word, that is, which programmes include information on AIDS. Beyond these stats, one can proceed and browse through each of the units in those modules that contain the search word and get to the actual content. This type of a search can be refined using a number of filters so that the results contain only what is relevant. These filters are shown in Figure 19.2.

CHAPTER 19 • CURRICULUM MAPPING AS INQUIRY IN HIGHER EDUCATION

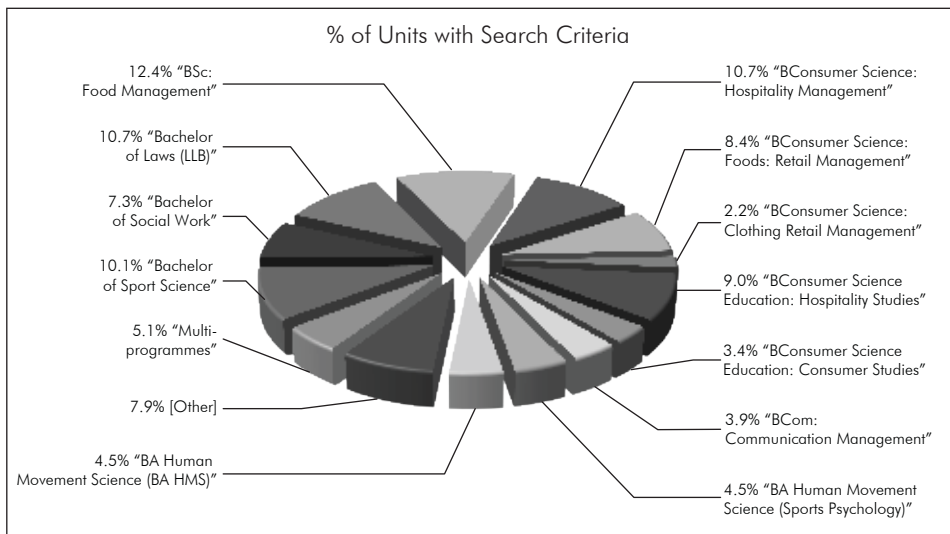


FIGURE 19.1 Search results for 'AIDS' in the curriculum

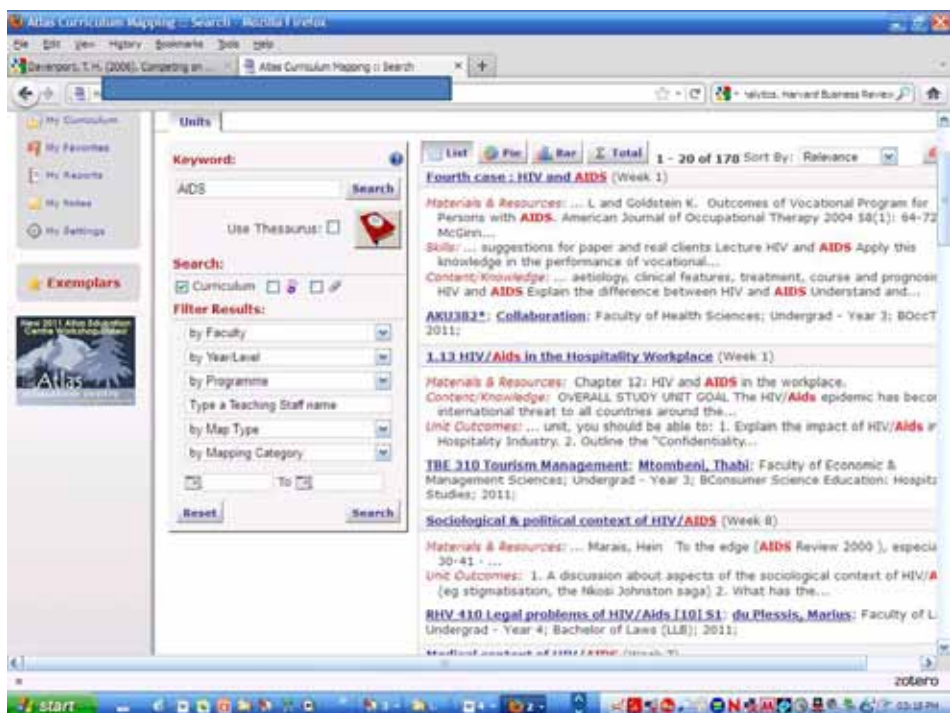


FIGURE 19.2 Screenshot of content with links to units and modules

PART THREE • METHODS FOR INTERROGATING, REVISIONING AND IMPLEMENTING CURRICULUM CHANGE

In the curriculum analytics view, a few modules can be pulled side by side with their topics spread over the calendar and viewed in a unit overview report (Figure 19.3). It is in this 'space' where conversations about gaps, redundancies, sequencing, and coherence can be initiated and followed through. Though the view provides topics taught in the modules, there are links to the full data of the content taught. Groups of teaching staff looking at the data together are able to raise questions about cognitive levels, curriculum load, gaps and redundancies in their curriculum and explore ways in which these can be attended to. Staff can investigate how a number of curriculum principles apply in their curriculum and thus reduce the gap between theory and practice.

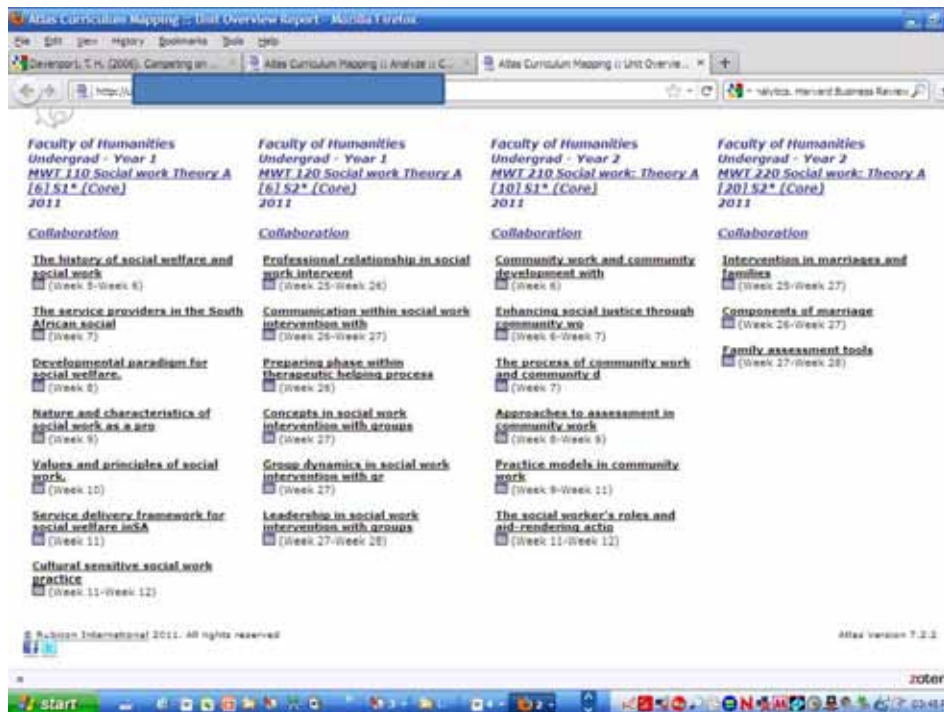


FIGURE 19.3 Unit overview report

THE CONCEPTUAL AND THE TECHNICAL INFRASTRUCTURE

It is necessary, however, to problematise the need for both conceptual and technical infrastructure when teaching and learning is concerned and not to take for granted that both are a given. It is only when both are well considered and catered for that one can talk about good cyber infrastructure for curriculum, the kind that will enable both delivery and inquiry. There are lessons learnt with the adoption of learning technologies in higher education. The adoption of Learning Management Systems (LMSs) revealed a clear distinction of how in some institutions the acquisition of these

CHAPTER 19 • CURRICULUM MAPPING AS INQUIRY IN HIGHER EDUCATION

systems became a mere technical project and how in others it was a conceptual one. As argued elsewhere (Madiba 2009:257), there was an emergent distinction in terms of those who concentrated on building the physical (technological) infrastructure to ensure availability of the necessary technology within the institution and those who made sure they armed staff with conceptual tools that would enable them to engage with the technology and use it to enhance teaching and learning. For those who were in a practitioner-led environment⁸⁵ the battle was more conceptual than technical. It was about building the necessary understanding of what learning is, and how to improve it. The focus was to dedicate institutional effort of implementing e-learning towards ensuring that this understanding exists and hence the need to spend a long time on developing the necessary staff competencies.

Those who concentrated on the technical side only missed an opportunity to ensure that the acquisition of the LMS resulted in improved teaching and learning. The same sentiments were echoed earlier by Weigel (2002) when he argued that if an infrastructure is to be built for depth education in higher education, it does not only require smart classrooms, wireless campus networks, or significant technical skills. His argument was that “the make-or-break infrastructure requirements for depth education are more conceptual in nature, and they begin with faculty” (Weigel 2002:102).

Conceptual infrastructure is a construct that has been adopted to refer to the theoretical (and conceptual) knowledge necessary to use available technology tools to enhance teaching and learning (Madiba 2009). The construct implies that sound theoretical knowledge of teaching and learning provides access to conceptual tools. A combination of these conceptual tools and the advances and affordances of technology can lead to innovative teaching and learning. Both the technical and the conceptual are necessary and the actual strength lies in how the two are intertwined. Whereas the learning management system (at least in its existing form) requires conceptual infrastructure as a prerequisite for good teaching and learning to take place, the use of a curriculum mapping system provides a platform on which to build this type of infrastructure. Where enough effort is placed in creating the electronic platform for curriculum mapping, the loading process becomes engaging and resembles an environment as if one is working with an avatar that will be asking questions every step of the way to ensure that the curriculum data loaded make sense and are pedagogically sound.

PUTTING THE MAGNIFYING GLASS ON THE CURRICULUM

It is necessary to find ways of what it means to put a magnifying glass on those structural aspects of the curriculum that can bring both the macro- and the micro-levels of curriculum to the fore. Programme description documents need to receive more attention than is the case currently, though one can argue that there is a higher level (the exo-level) that should be the starting point and that is at the graduate

⁸⁵ There was a difference in terms of whether the implementation of the LMS was ‘practitioner-’ or ‘management-led’.

PART THREE • METHODS FOR INTERROGATING, REVISIONING AND IMPLEMENTING CURRICULUM CHANGE

attributes' level – what the curriculum has to achieve beyond the programme, its worth at an institutional, national and international level. It becomes useless to have these statements spelled out somewhere else in the institution with no direct links to what is being taught and how it is being taught. What a good curriculum mapping system can allow is to create the much desired links among the graduate attribute statements, programme description, professional bodies' criteria and standards where they exist, the individual modules or courses associated with a specific programme, and to drill down to the units within the modules. Documenting curriculum across these levels provides opportunities to ask questions about how those links can be created and how they should be strengthened. In terms of curriculum analysis it provides deeper opportunities to interrogate the relevance of these statements (graduate attributes) and the quality of programme description documents.

Working with curriculum mapping has provided ample opportunities to revisit the almost forgotten SAQA-registered versions of programme description documents. The CM environment exposes the conceptual tools that exist, those that should be used to interrogate what those exit level outcomes (ELOs) mean or are supposed to mean and how they should be translated into teaching and learning practice. This cannot happen without taking a step back and asking if the ELOs are fit for purpose. At the meso-level the CM environment creates space for questions on articulation, progression, coherence and logical sequencing to surface. This happens alongside possibilities to explore where gaps and redundancies exist in the curriculum; that is, across the different modules or courses. It is in this context where the Higher Education Qualifications Framework (HEQF) apparatus become enlivened. Qualification descriptors acquire specific functions; they become tools to investigate how to differentiate a programme that aims to provide vocational and technical skills from the one that aims to cater for academic knowledge and skills. What does this mean in terms of programme design and delivery? How useful is this differentiation?

In the same way level descriptors acquire functional application when one has to examine logical sequencing, progression and coherence of modules in a programme. They provide a grammar through which the language of sequencing can be appropriated for use. The allocation of credits in programmes and modules moves away from being a technical and arithmetic issue (as long as they add up!) to ways in which questions of breadth, depth, scope and level can be interrogated. Those involved can begin to clarify their own thinking about what to look for in order to understand whether a programme or a module is overloaded or whether it is too scanty or even shallow in terms of curriculum coverage.

Credit allocation can be taken to the micro-level where a 'credit map' within a module can be drawn. This is where units within a module are mapped and in the process one asks questions about the level of engagement envisaged in each module. What content, what teaching, learning and assessment activities will be involved, when and at what level? The real challenge here is not to give statements about these questions,

CHAPTER 19 • CURRICULUM MAPPING AS INQUIRY IN HIGHER EDUCATION

but to design the teaching, learning, and assessment plans and activities and make content choices in such a way that answers to these questions are provided. Instead of empty claims about active or transformative learning and constructive alignment, the CM environment asks how all such will be achieved. The lecturers get to ask themselves: By the way, what does all this mean anyway? The visibility or non-visibility of those ideals (student engagement, active learning, and transformative learning, for example) in the developed plans becomes a topic for rich conversations.

Part of what will happen at this level of engagement is to give meaning to the essence of notional hours. As curriculum data are being loaded into the system, useful information is being gathered on the consistencies or inconsistencies that exist as far as credit allocation is concerned. Within this context, it becomes easier to interrogate the conceptualisations of what is incorporated in the notion of credit allocation: Does it only involve implied notional hours? How does, what happens in the classroom (in cases where there is face-to-face teaching), continue to occupy students long after they have left (the classroom)? How is content taught in such a way that sends students on a rigorous journey to search for more? What about the level at which the outcomes to be achieved are pegged? What about the nature of the content to be learned? Responses to these questions serve as examples of how curriculum quality apparatus are translated into practice and how they become tools for curriculum inquiry.

At a practical level a well-developed CM system will engage the role players in a process where they have to bring in the graduate attributes a programme has to nurture, as well as the exit-level outcomes and associated assessment criteria, and give them visibility in all the plans associated with the delivery of modules within that specific programme. This becomes an opportunity to think through which module will concentrate on what aspects of the attributes and the ELOs, and at what level (first, second, third year and so forth). Documenting the curriculum in each module becomes a way to address this type of a planned and logical 'spread'. The template within which the documenting happens should be kept dynamic and flexible enough to ask all the relevant questions and to create space for the necessary answers. The actual process starts at unit level within a specific module and yet the template asks what ELOs and graduate attributes this unit will address. Through the assessment plan the environment will ask at what level assessment tasks are pegged and in this way call for relevant level descriptors. In the 'standards profiling view' one can get a report of which outcomes were associated with which modules and which of those outcomes were implied (or excluded) in the assessment plans. What would happen is that the graduate attributes and ELOs would be preloaded so that when one works with the module and its units it would be possible to allow for the necessary choices and associations. In this way the relationship between the macro- and the micro-level is enabled; one does not necessarily start at either the macro- or the micro-level, but at both.

A well-designed CM environment should provide conceptual tools in the background. For example, when supporting role players in developing teaching and assessment

PART THREE • METHODS FOR INTERROGATING, REVISIONING AND IMPLEMENTING CURRICULUM CHANGE

plan inventories of teaching, learning and assessment approaches, strategies and methods can be hanged in the system as drop down menus. These menus cannot be used as checklists to tick which approach, strategy and methods one will employ in this unit within this specific module. The inventories first and foremost provide a language to enable those involved to talk about teaching approaches, strategies and methods given the nature of the content to be dealt with. It is always interesting to see the level of curiosity and excitement that arises when individuals are exposed to these inventories. The biggest advantage is that because these cannot be exhaustive lists, technology allows quick expansions and additions where there is a need to do so. The inventories create significant stops at which role players are enthused to take a break in the documenting journey of their curriculum and to ask: By the way, what is this (an approach, strategy or method)? and to pursue further questions like: How do I personalise this within my teaching practice? This works far better than inviting lecturers to the training room to come and workshop teaching methods. When the latter option is followed, these are discussed in isolation and application is highly threatened.

The content part works in a similar mode: the environment asks what knowledge, skills, and values are to be targeted in this unit within this specific module as a way of addressing the envisaged graduate attributes, ELOs and in some cases professional bodies' standards and criteria. This is where ample evidence has been gathered about how entrenched the knowledge-based approach to curriculum delivery is. It is a huge struggle in many cases to get lecturers to talk about anything else as content beyond the knowledge aspects of what has to be taught. One has to be more careful here as the word *content* is synonymous with *knowledge* to many. The assumption here is that content is not limited to knowledge only, but that it includes skills, attitudes and values, and that before one can claim integration there should be some refined thinking in terms of what is really involved.

Many lecturers would immediately spell out the disciplinary knowledge of what they have to teach and in the process ignore the accompanying skills and values. This might be one reason why students do not fully acquire the necessary graduate attributes, since many of these transcend beyond disciplinary knowledge. One can even argue that to ignore some of these skills and values denies students the tools needed to engage with the very disciplinary knowledge put before them. This is where arguments about epistemic access find value and where other nuances associated with curriculum become visible. For example, ignoring values does not mean that what is taught is value-free. It actually opens an avenue to pin down the hidden and the null⁸⁶ curriculum, especially as argued in critical educational literature. CM brings to the fore and instigates conversations to confront these types of issues and in this way enriches 'lines of inquiry' in an institutional curriculum development project.

⁸⁶ See Michael Apple's (2004) 'The Hidden curriculum' and 'Nature of Conflict' in *Ideology and Curriculum* and Jonathan Jansen's *Knowledge in the Blood*, 109-110.

LINES OF INQUIRY

There are many questions to be asked when continuous improvement is the guiding principle in curriculum development and teaching and learning as a whole. A CM environment that is well configured helps in asking this one self-reflexive question: How well am I teaching? In an environment where the culture of quality development is to be strengthened to supersede that of quality assurance there are many more significant questions to pursue, such as:

- Is there alignment horizontally and vertically across and within modules; internally and externally across units within modules?
- What about constructive alignment between what is taught, how it is taught, what is assessed and how it is assessed?
- What has been lost in the planned curriculum as against what is taught; how significant is the loss?
- What absences and presences are visible in the curriculum and what impact do they have on student learning?
- What about cognitive demand?
- What about gaps and redundancies?
- How well documented are decisions to change the curriculum from time to time; how are these changes tracked and theorised?
- What about articulation across co-existing units and modules within a programme and possibilities for credit transfer?
- What informs decisions to change curricula within registered and existing programmes?
- How do institutions, faculties and departments keep track of changes made?
- How are those who teach afforded the opportunity to question and debate changes made to the curriculum they have to deliver?

These questions find form and existence when curriculum mapping is embraced. Attempts to systemically follow these lines of inquiry and pursue answers are rendered impossible and fail to lead to productive inroads into curriculum and teaching and learning reform; that is in cases where there are no supporting systems to enable such processes. The work of English (1980, 1992) and Frase, English and Poston (1995) in curriculum management and auditing was moving into sterile quality assurance conclave until curriculum mapping was repurposed and moved in the direction of quality development. Jansen (2009:194) articulates the challenges of how some curricula evaded the “modular-based curriculum radar screen” and “the sweeping reforms of five years of curriculum change” in a university. He further indicates how more than 500 modules made it almost impossible to scrutinise each learning unit where the line of inquiry was “to determine the extent to which it shifted the deeper understanding of race, knowledge, and identity toward a more open, tentative,

PART THREE • METHODS FOR INTERROGATING, REVISIONING AND IMPLEMENTING CURRICULUM CHANGE

and democratic knowledge of school and society” (Jansen 2009:194). Curriculum mapping offers the opportunity to work through each unit of all the modules involved, and the challenge is to embed the questions to be asked into the system so that (re) developing the module and its units becomes the same chore as responding to the tough questions that have to be asked. Those involved with the modules have to ask themselves these questions long before any external reviewer comes. Configured in this way the CM environment becomes a platform for reflective and reflexive dialogue for module owners and teams, so that long before any other stakeholder can demand accountability, they would have engaged in self-evaluation of their curriculum.

The developed template used in the CM system can easily be converted into a programme/module/unit evaluation rubric. A well-informed translation of quality apparatus can provide evaluation tools for other areas at the different levels of the curriculum. For example, how do we know if exit-level outcomes are sound and if programme description is appropriate, that is, given all the disciplinary, institutional, national and international imperatives that the programme has to respond to? Lessons learnt from the process of curriculum mapping provide rich data from which to set and strengthen an evaluation agenda for curriculum practices in a contextualised manner. How does curriculum in the programme, in the modules and in the units (of the modules) compare internally (within the programme, across the modules and units) and externally (with programmes in other institutions)?

ANY BLIND SPOTS OR DOWNSIDES?

Curriculum mapping is beginning to gain popularity in higher education internationally. Uchiyama and Radin (2008) argue that for higher education, CM can support a culture shift, from one that values individualism and autonomy to one that values collegiality and collaboration, fostering respect for the professional knowledge and expertise and allowing all participants to examine, or re-examine, their individual and collective beliefs about teaching and learning in a structured and safe setting. It is interesting to hear lecturers say how much of a ‘first’ it is for them to have the opportunity to ask questions to their colleagues about what goes before and what comes after their modules with data in front of them. This is the one strength about the system: it organises curriculum data within a programme and across programmes in such a way that one can have a helicopter view of where what is covered and yet also drill down to the finer details of the coverage.

The same strength can be viewed as a downside by others. As Uchiyama and Radin (2008) argue, those who would want to cling to the culture of “individualism and autonomy” will not welcome a system of this nature. To them it will be too much exposure, allowing colleagues to ask informed questions about the what, how and why of their teaching. For them the system will bring in interference and threaten their autonomy.

CHAPTER 19 • CURRICULUM MAPPING AS INQUIRY IN HIGHER EDUCATION

Another aspect that raises concerns is that when teaching staff become exposed to the system for the first time, they do not appreciate the learning curve they face in order to be able to use the system. Though technology system and product designs have moved to a reasonable level of intuitiveness, some new users still feel highly intimidated. It is useful to develop and continuously improve the end-user interface in a system like this so that it remains friendly and familiar to new users. This is the reason why the research and development part of the project should remain active.

ENABLING TECHNOLOGIES AND IMPLEMENTATION CHALLENGES

Udelhofen (2005) indicates that there are now a number of curriculum mapping software programs that allow users to perform sophisticated tasks to enhance their mapping experience. This is true. Yet, even with such a variety and level of sophistication in the context that informs the work in this chapter there was a great need to customise and to ensure that the software ‘speaks’ the intended language of quality development within a South African higher education context. Care had to be taken to ensure that the system articulates as closely as possible to the conceptual tools, principles and evaluation criteria implied in curriculum practice in higher education. Besides allowing the university community to wrestle with conceptual tools associated with curriculum delivery, the project provides an opportunity to investigate system requirements for such an institution-wide agenda and to establish what technologies are available to support such a venture. This adds another exciting part to project research and development with many possibilities for innovation.

An area that should receive immediate attention is that of ensuring interoperability with other existing data management and web-based systems in the institution. For example, it will add great value if the CM system is easily able to share data with the learning management system. If well configured, the development of study (and learning) guides should be supported by curriculum maps. Curriculum maps should inform the use of computer-based testing systems.

When curriculum maps are fully developed and institutional curricula are well captured there are possibilities to create multiple and varied web-based views in such a way that various stakeholders (internal and external to the institution) are given access to what is of relevance to them. This possibility has yet to be fully exploited. This includes the possibility of providing students with a web version of curricula to assist in making meaningful choices and sound combinations. With the developments in HTML 5, information on curricula can be made accessible to students from their mobile phones, thus to some extent eliminating the long queues that make programme and course registration a nightmare at many institutions.

CONCLUSION

Working through a number of case studies provides a platform from which to understand the nuanced challenges in curriculum development; for example challenges facing

PART THREE • METHODS FOR INTERROGATING, REVISIONING AND IMPLEMENTING CURRICULUM CHANGE

multi-disciplinary programmes and those with multiple areas of specialisation. Added to this challenge is a scenario where a particular disciplinary area is deemed to be relevant to a variety of programmes and as such the content is repeated across a number of programmes. There are cases where many areas of specialisation compete for inclusion within the same programme resulting in what can be termed *credit wars*: which components are bullied out to keep the total credit at a reasonable count? In a different scenario there are cases where a number of modules with different titles and codes share the same content to the extent that students in these modules can sit in one class for the whole term and write the same examination. Sometimes the same content is offered to groups in different year levels with varied credit allocation and this raises questions about cognitive demand, for example. In another case generic skills (or professional skills) are redundantly offered across the different levels of a programme (first-, second-, third-year level) to fill credit gaps. Thus, generic skills become (unnecessary) credit fillers. These examples illustrate a number of tensions in curriculum design and provide avenues from which solutions to these tensions can be better theorised.

Conversations with academics at the initial stage of engaging in the CM process revealed that part of their interest in the system is motivated by a need to manage the scope of their modules in the allocated time. It is becoming increasingly necessary to provide a systematised approach through which the scope and curriculum workload of a module and programme can be analysed and planned for accordingly. This level of planning as captured in the curriculum map can then inform pace within the module, given the content and the enrolled cohort, thus assisting the lecturer in assessing and determining whether the pace is realistic. Therefore the system can assist in addressing over-teaching (too much classroom teaching), or the reverse in areas where applicable. Handling workload issues within curricula is another area that needs better theorising.

Study guides appear to be the main detailed curriculum records within the university setting, that is, in addition to the year books whose information is skeletal. Where extra documentation is available, the format and content is greatly varied. The existing CM cases provide ample evidence that there is much curriculum information that is sitting with experienced academics and is not recorded anywhere. Such a scenario threatens the induction of new academics into the departments because curriculum implementation knowledge is not handed over and therefore it is lost. New academics often find themselves reinventing the wheel instead of improving what exists. Curriculum development becomes a very tedious process that is often compromised in an attempt to create time for research. Once module curriculum maps are developed, improving them becomes a lighter task in the subsequent years and in the process the understanding of various strategies for good curriculum delivery deepens.

The use of senior and postgraduate students to help in the initial loading of curriculum data into the system adds a special feature to the process. It is not only a way to

CHAPTER 19 • CURRICULUM MAPPING AS INQUIRY IN HIGHER EDUCATION

free lecturers for a deeper and more rigorous involvement; it opens up student participation to curriculum design and development. When students are allocated to load programmes for which they are enrolled or have already gone through, they are provided with a platform to reflect on their curricular experiences and to offer some critical evaluation that can enhance improvement. Students have expressed how working within the system has helped them to develop insights into the curriculum.

Overall, curriculum mapping provides a way to make curriculum more explicit. It allows those responsible for curriculum delivery to question their understanding about how specific content has to be taught and why, and in the process seek to understand the nature of the content better. In other words, Bernstein's constructs of verticality, grammaticality, classification and framing (Muller 2006) can be better explored in an environment where curricula are mapped. The availability of curriculum maps can serve as data to grapple with what "knowledge and knower structures" can mean for better pedagogy and educational reform (Maton 2006).

Conceptualising curriculum mapping in ways articulated here promises to move curriculum inquiry into the fourth era as envisaged by Wadsworth (2010). The mapping process creates a buzz about curriculum delivery and consequently about teaching and learning. Many questions are brought to the surface. This becomes more critical in the research-oriented university where teaching has not always received the same attention. Curriculum mapping holds promise to valorise teaching under such circumstances. Curriculum development (together with design and delivery) is turned into a living activity and lecturers in their module and programme teams are forever reminded to stop and to reflect and to grapple with the many lines of inquiry that surface throughout the process of creating curriculum maps. With the maps that are created, better ways to explore questions of identity, power relations, agency and transformation, among other things, emerge. Those who dare to become active action researchers assume their agency and provide brokerage to mobilise further conversing, observing, reflecting, learning, changing and acting for better curriculum implementation.

REFERENCES

- Anderson T. 2004. Toward a Theory of Online Learning. In: T Anderson & F Elloumi (eds). *Theory and Practice of Online Learning*. Athabasca: Athabasca University. [Retrieved 20 April 2006] cde.athabascau.ca/online_book/pdf/
- Apple MW. 2004. *Ideology and curriculum*. 3rd Edition. New York: Routledge Falmer.
- Berman F. 2008. Making research and education cyber infrastructure real. *EDUCAUSE Review*, 43(4):18-32.
- CHE (Council for Higher Education). 2010. Framework for the second cycle of quality assurance 2012-2017. [Retrieved 20 January 2011] http://www.che.ac.za/documents/d000214/A_Framework_for_the_Second_Cycle_of_Quality_Assurance_2012-2017.pdf

PART THREE • METHODS FOR INTERROGATING, REVISIONING AND IMPLEMENTING CURRICULUM CHANGE

- Department of Education. 2007. Higher Education Qualifications Framework. Pretoria: Department of Education.
- Educause. 2010. *7 things you should know about analytics*. [Retrieved 2 February 2011] <http://net.educause.edu/ir/library/pdf/ELI7059.pdf>
- English F. 1980. Curriculum mapping. *Educational Leadership*, 37(7):558-559.
- English FW. 1992. *Deciding what to teach and to test: Developing, aligning, and auditing the curriculum*. Newbury Park, CA: Sage.
- Frase LE, English FW & Poston WK Jr. 1995. *The curriculum management audit: Improving school quality*. Lancaster: Technomic.
- Jansen JD. 2009. *Knowledge in the blood: Confronting race and apartheid past*. Cape Town: UCT Press.
- Madiba M. 2009. Investigating design issues in e-learning. PhD dissertation. Bellville: University of the Western Cape.
- Maton K. 2006. On knowledge structures and knower structures. In: R Moore, M Arnot, J Beck & H Daniels (eds). *Knowledge, power and educational reform: Applying the sociology of Basil Bernstein*. New York: Routledge. 44-59.
- Muller J. 2006. On the shoulders of giants: Verticality of knowledge and the school curriculum. In: R Moore, M Arnot, J Beck & H Daniels (eds). *Knowledge, power and educational reform: Applying the sociology of Basil Bernstein*. New York: Routledge. 11-27.
- Online Analytics. 2010. *Glossary*. [Retrieved 31 July 2010] <http://www.onlineanalytics.com.au/glossary>
- Pawson R. 2006. *Evidence-based policy: A realist perspective*. London: Sage.
- Uchiyama KP & Radin JL. 2009. Curriculum mapping in higher education: A vehicle for collaboration. *Innovative Higher Education* 33(4):271-280.
- Udelhofen S. 2005. *Keys to curriculum mapping: Strategies and tools to make it work*. Thousand Oaks, CA: Corwin Press.
- Wadsworth Y. 2010. *Building in research and evaluation: Human inquiry for living systems*. Hawthorn: Action Research Press.
- Weigel VB. 2002. *Deep learning for a digital age: Technology's untapped potential to enrich higher education*. San Francisco, CA: Wiley.