

# Knowledge Management in Post-Secondary Education: Universities

## 1. Introduction

According to the dictionary, knowledge is the sum of what is known, the body of truth, information and principles acquired by mankind. Knowledge is related to intellectual capacities, but it is also linked to observation, experience, study and investigation. Dictionary definitions are still lacking a connection to what knowledge means in the term "knowledge management". In that context, knowledge is very closely associated with the implications of ICT for our way of dealing with information.

In our era of a knowledge society and a knowledge economy, it is clear that universities have a major role to play. Capital and labour are no longer the dominant production factors. They have been superseded by knowledge. Therefore, knowledge management has become the key issue. I was asked to talk about this from a university perspective. Actually, knowledge management is what universities have been involved in ever since they were established.

I know that the word "knowledge management" is used with a different meaning these days. Although it is hard to find a generally accepted definition, one could say that *knowledge management embodies organizational processes that seek the synergistic combination of data and information processing capacity of information technologies, and the creative and innovative capacity of human beings*<sup>1</sup>. No matter how modern and even fashionable this may sound, this is exactly what universities have been doing for centuries – minus, of course, the reference to information technology. But information technology, computers, are only instrumental, not essential.

Ever since their inception, universities have been occupied with the fundamental elements of what we now call 'knowledge management', i.e. the creation, collection, preservation and dissemination of knowledge. In what follows, I would like to clarify in what ways a modern university deals with knowledge management. I will use some examples taken from the situation I know best: the university of Leuven.

When I stress the fact that universities have been involved in knowledge management for so many centuries, this does *not* mean that I am blind to the tremendous challenges which modern universities are facing. One of these challenges is the way we are coping with what is generally called our *stakeholders*. Universities are no longer living in splendid isolation. They have their own place in society, and they have a responsibility to society, which expects something in return for the privileges it has granted universities. I will elaborate on this essential change later on. It is just one of the developments which will undoubtedly change the very idea of a university. But even this is nothing new. Also in the past, universities have shown themselves to be extremely flexible - maybe not in the short run, but definitely over a longer period of time. This is made very clear when we take a small tour through history.

## 2. Historical framework

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<sup>1</sup> <http://www.brint.com/km/whatis.htm>

Let's return to the time when our universities were established, the central period of our Middle Ages. Roughly speaking, the origin of our universities, or at least of the idea of our universities, can be situated around the year 1200. The venerable Oxford university dates from this period, 1187 to be more exact. Obviously, the universities of those early days differed quite a lot from what we call a university nowadays. Collecting knowledge, preserving it and passing it on were more important than creating or applying knowledge. The professor was a scholar, not a researcher. Medieval universities considered themselves to be the protector of human knowledge, but they did not feel the urge to make it grow. This was a logical consequence of the static world view of the Middle Ages. Instead of searching for new knowledge, there was an unlimited respect for classical knowledge. Knowledge was something considered to be complete and static, at least: static in *time*. In space, knowledge was quite mobile. The *Wanderstudent*, the young scholar who moved from one university to another, was a fairly common phenomenon. This wasn't so hard to do: Latin was the common language, and also the content of the curriculum was roughly the same. After all, everyone was studying the same classics. The ideal was complete knowledge of the *septem artes liberales*, the seven 'liberal arts' which, taken together, were the whole of human knowledge. We would call them 'sciences' or, in some cases, pseudo-sciences.

Scientific research formed no part of the university's outlook. This became more tangible with figures like Ockham, who realized the importance of logic in knowledge acquisition, and especially Francis Bacon, the father of observation - and therefore of the scientific experiment. Their work did cause an immediate revolution in dealing with knowledge and science, of course. Universities continued to be the door to classical knowledge. Gradually, they also became the suppliers of officials, inside and outside the clergy, who needed to be employable in as many places as possible. There was not yet any specialized professional training.

This changed drastically at the beginning of the 19<sup>th</sup> century, in Germany, mainly because of the ideas of Fichte and Wilhelm von Humboldt. The knowledge of nature had, in the meantime, expanded significantly, especially since Newton. This growth, however, did not take place within the walls of the university, but in institutions such as the British *Royal Society*. Nor was professional training the university's main goal. As John Stuart Mill<sup>2</sup> stated very clearly: Universities are not "*a place of professional education... Their object is not to make skillful lawyers, physicians or engineers, but capable and cultivated human beings.*" Or to quote Cardinal Newman: the duty of a university is to prepare young adults *to fill any post with credit, and to master any subject with facility*. University education was very general. It aimed to shape the mind and the intellectual capacities, but it was not meant to lead to *professional education*, not technologically, not scientifically - although both had matured considerably in the meantime.

Fichte and especially Wilhelm von Humboldt changed all this. In 1809, von Humboldt established the Berlin University, where he attempted to materialize his ideas. In his opinion, a university should approach knowledge *scientifically*. It should *produce* knowledge, not *re-produce* it. Von Humboldt was a revolutionary thinker, who attempted to do away with a whole series of basic components of traditional university education. For instance, he stressed the *individual* freedom of those who came to university to better themselves. Obviously, this idea was nurtured by the intellectual climate of the Enlightenment. Another idea introduced or propagated by von Humboldt was the concept of *Lehr-freiheit* and *Lern-freiheit*. This meant

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<sup>2</sup> J.M. Robson (ed.), *Collected Works of John Stuart Mill: Vol. 21*, Toronto-London, 1984, p. 218.

that the student should be given the freedom to choose his own curriculum, and above all that the professor should have the freedom to select his own field *without* relying too much on what the classical writers said about it, or on what the university management prescribed. It is clear that this paved the way for the current dominance of scientific research in the university's profile, and of academic freedom for professors.

Naturally, von Humboldt's ideas caused considerable criticism. It was said that his views would lead to isolation and non-exchangeability. There was some truth in this criticism, of course. If every individual professor chooses his field in complete freedom, it becomes intellectually impossible to visit other universities in Europe, which, as I said, was one of the predominant phenomena in medieval universities. But that danger was only a theoretical one. Furthermore, this was also the time when national interest became an important issue in government policy concerning universities. Also from this point of view, isolation was not a real problem.

It should also be stressed that von Humboldt's views were *not* precursors to what we would call professional training. That did not fit with the idea of academic freedom, which would be most easily attained if the academic world were to occupy itself with matters which had *no* practical use - and therefore universities, in theory at least, had neither an influence on society, nor interaction with it. .

It would lead us too far afield to go deeper into 19<sup>th</sup>-century university history. But it is clear that the modern view of the university took shape here, in the space of a couple of decades.

Let us now focus on this modern university, and summarize its basic components. A modern university is characterized by the *co-existence* of a series of fundamental elements.

- The most important one, and the basis of everything, is *knowledge creation*. This is, obviously, the world of academic research.
- The second characteristic of a modern university is *knowledge dissemination*, which means that the knowledge created by research is spread among university students, together with a modernized approach to the classics. *Knowledge dissemination* is the second characteristic of a modern university. This is not only meant in the narrow sense of the word, which is dissemination through regular classes, but also the whole complex of attitude formation, value transfer, skills training etc. - in other words: education in the sense of *Bildung*.
- And the third component of a modern university's profile can be found in *academic service to society*. In a way, the previous components, knowledge creation and knowledge dissemination, are also services to society. But here, something more specific is meant. Scientific service to society usually refers to the process of transferring university knowledge to society at large, including the economic world.

So it becomes clear that universities, throughout their history, have been dealing with radical re-orientations. It is quite possible that we are in the midst of such a period right now. For some observers, there are signs of the end of the university as we know it. They claim that today's requirements are too much for any university, and that the university is on the verge of being superseded by other institutions. I don't think there is any truth to that view - to the contrary! I think that its considerable experience with fundamental re-orientations makes universities perfectly equipped to adapt themselves once again, in order to play a role, and even a key role, in modern society.

In this short historical survey, I have referred to the three basic duties of a university, and not without good reason. By focusing on these three essential and interrelated tasks, a university provides itself with an excellent platform to underline its role and relevance in today's society. This is true in general, but it also fits perfectly with the topic of this colloquium. It is my firm conviction that, with a suitable and multifaceted approach to "knowledge management", universities can guarantee their own survival *and* at the same time prove that they are essential to modern society. I hope I will be able to demonstrate this to you. In order to do this, I would like to make use of this well-known threefold duty of the university.

Usually, service to society is put in the third place. I would like to reverse that order, and start with service. Then, I will move on to education, and finish with research. I will deal with that duty more extensively, because this is the area where knowledge is actually created. In a knowledge society, this will prove to be increasingly important.

### 3. Service to society

Let us start, then, with the university's service to society. This includes a multitude of tasks, from contract research and scientific popularization to job creation through spin-offs. Our knowledge management perspective can take many shapes. I will sketch a few of them very briefly. I have treated this subject more thoroughly in a separate paper, on *Management of Knowledge Transfer*<sup>3</sup>.

Knowledge management viewed from the point of view of service to society means that the university has to guarantee the most efficient contact between university research results and possible applications in economic life. Direct involvement in economic life will probably never be the main objective of a university, but it would be wrong to exclude the link between the world of research and the world of business. This link creates promising possibilities. One of the most important ones is the cross-pollination between research and business. On the one hand, the economy receives valuable input, which can generate added value and new jobs, and on the other hand, a university receives additional income and valuable feedback, which, in turn, can be used to improve research results, or to start completely new research. Furthermore, this mutual contact will be of great benefit to our students, who get to know the culture of business and industry, which will make them better equipped to take up jobs after graduation.

This knowledge transfer rarely happens all by itself. Companies still don't have the habit of knocking at a university's door, and university staff lack the experience or the courage to enter into business life. In Leuven, more than 25 years of experience with a very special and successful service has bridged this gap. This service, called *Leuven Research and Development* or *LRD*, has many functions:

- It acts as a go-between and a market-place, connecting business life with the world of research, in both directions.
- It also acts as an active broker of research results, looking for ways to commercialize them. LRD tries to bring promising research in contact with promising companies. In other words, LRD performs scouting and prospecting.
- It also has an important role as an adviser, acting as a trusted assistant in the murky waters of intellectual property rights, and in the establishment of spin-offs. Some 40 of these

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<sup>3</sup> <http://www.kuleuven.ac.be/knowledgetransfer.htm>

companies have been created, some of which have grown into true world leaders in their particular niche.

A second way in which service to society coincides with knowledge management can be found in communication. Although the ivory tower has disappeared, the outside world still perceives universities as "black boxes". This means that it is often very difficult for the outside world to know who is doing what. In a knowledge society, know-how is one thing, and know-why is another. But also the *know-who* is becoming increasingly important. In this respect, universities should try to communicate more openly and more actively about the many specializations and specialists within its walls.

A third way universities can materialize their knowledge management can be found in the popularization of science. If we are truly living in a knowledge society, universities have the duty to spread their knowledge to society at large. This is not so much a matter of knowledge transfer, but of knowledge dissemination. It used to be beneath most professors' dignity to engage in this popularization, but I think it is a good thing this is changing.

The fourth component of service to society is 'permanent or lifelong learning'. In a knowledge society, the half-life of knowledge is rapidly decreasing. What our students are learning today, will be obsolete tomorrow. In order to prevent this, universities have to offer a wide-ranging array of courses, seminars etc. to make sure that graduates can keep up with scientific developments. Learning how to learn should be the main target of our students, and universities should encourage and accompany them in this direction. This does not stop on the day of graduation. Instead, we should start thinking of university degrees as including permanent maintenance contracts.

There are many more ways for a university to use its duty of service to society as a platform to materialize its knowledge management. Let me just mention two more examples.

- It would, for instance, be possible to contribute significantly to alternative publication structures based on preprint servers on the Internet. This would allow scientific progress to be kept out of the hands of certain publishers who are becoming all too greedy.
- And finally, it would also be possible to digitize large parts of the non-copyrighted holdings of our libraries. There are local initiatives in this respect, but they are limited to individual institutions, leading to duplication or unstructured digital collections.

#### **4. Education**

Let us now move on to the second of the three main tasks of a university, which is, obviously, education, based on research. University education is aimed at the dissemination of knowledge, not merely of information. There should be a balance between the two.

In a knowledge society, the basic duty of education is to familiarize our students with methods of coping with the rapidly growing and changing amount of knowledge. These methods are becoming increasingly important, although this should not make us shy away of communicating certain amounts of factual knowledge. I am aware that the transfer of encyclopedic or factual knowledge has become paedagogically suspect. This is an understandable evolution, but not necessarily a good one. There is nothing wrong in expecting our literature students to know that Dante did not live in the 19th century, or a chemistry student to know that the symbol for gold is *Au*.

The basic requirement, however, is to design education in such a way that the focus is more on *learning* than on *teaching*. Teaching is a finite activity, which ends as soon as the teacher is no longer around. Learning, however, is infinite, and can take place anywhere, anytime. Learning how to learn should be the main target. Universities have to provide their students with the methods to learn actively, for the rest of their lives. This means, among other things, that our students should be exposed to search methods and to methods of critical evaluation. In turn, this means that we cannot limit university education to just professional training. This will remain important, but it would be dangerously wrong to limit ourselves to that alone. Professional training needs to be embedded in a wider framework, in which more general skills need to be developed, such as language and communication skills, ethical sensibility, and so on. In times of so-called high-tech developments and in a world which is supposed to be giving so much importance to material goods, this looks a bit *soft*. The truth is, simply, that the more technologically advanced a society is, the more its competitive edge is found in non-technological skills. This means that modern universities should not forget the aspect of *Bildung* in their program. There is nothing wrong with university graduates being excellent professionals, but that is not enough. Immaterial elements in their education may well prove to be the most important and the most valuable competitive edge. Let me just give one simple example. There are many specialists who can perform a large and sophisticated customer survey. There may, however, be only a few people who are able to interpret the data and to take the right decisions.

It is clear that education, or knowledge dissemination, is an essential part of a university's contribution to today's society. This contribution can only be reliable if there is sufficient guarantee of this education's quality. In Leuven, we have a twofold approach to this.

- One is a process of thorough evaluation, by the university itself as well as by students. This is meant to evaluate the qualities of the individual professors and the way they perform. Among other things, this means that their textbooks are evaluated, the learnability of their courses, the way they support their students, etc.
- The second approach is a process of external quality control, the so-called *external reviews*, which are done by groups of top specialists in their respective fields.

In short, education is an essential component of today's knowledge society, and universities will continue to play a key role in this respect.

## 5. Research

No matter how important education may be, it is clear that research is the very heart of a university. Speaking in terms of knowledge management, research could be called *knowledge creation*. It seems obvious to regard research as the real contribution of a university to our knowledge society. The question is if this is really true. *If* research is truly the essence of a university, then why would we not want to reduce ourselves to mere research institutions, such as, for instance, the *Max Planck Institut*? Nobody seems very anxious to move into that direction, and for very good reasons. The true distinctive feature of a university, its real foundation, is the combination or even intertwining of research *and* education. Research should have a direct and dynamic effect on education, and education should provide new researchers. Another very particular characteristic of a university is, of course, its constant rejuvenation: young researchers are continually pouring in, working under the guidance of senior professors. It should be noted that many of these young researchers continue working

for the university in their post-doctoral years, which is considered to be the most productive period in the life of any academic.

It is impossible to mention research without discussing the matter of academic freedom and, in most cases, of the tenured position. Ever since von Humboldt's days, academic freedom has been mainly concentrated in research. Fundamental research, not aiming at applications, was considered to be the basis of any university's mission, which could, then, be summarized as some kind of *useful uselessness*. It was inappropriate to ask questions regarding the cost or relevance of this type of research. True enough, there can be no doubt about the sense of this type of research, but this does not mean that it can claim *total* freedom. Especially now, when the question of the *critical mass* is very prominent, absolute - and therefore: individual - freedom has become impossible. This is the starting point of a very delicate balancing act. On the one hand, true innovative knowledge can only (or primarily) be born in a climate of freedom, but on the other hand, the sheer size of the growing body of modern research requires a certain type of organization and accountability. This requirement becomes even more obvious when we bear in mind that a major part of research is financed with public funds. On the level of the individual researcher, the best choice would be to allow him all freedom in the *evolution* or *development* of his research, but not in the choice of his topic. Simply put: if you work in a research group, you can't claim total freedom. And yet another reason why organization is needed lies in the simple fact that research results fall within the scope of intellectual property rights. These cannot be sufficiently guaranteed without some form of organization, and thus of some limitation of academic freedom.

Research policy can be organized 'top down', which means that the main initiative is with research administration authorities, or it can be organized 'bottom up', which means that the individual researcher or research group takes the initiative. In Leuven, the individual researcher is welcome to submit any request for funding, and his project will be judged on the basis of its merits. However, once certain ways of financing have been accepted, certain quality assurance procedures must be observed. Obviously, as I just said, certain research areas are beyond the reach of an individual researcher, but the basis is still that individual academic freedom is the rule, and that any researcher's individual innovative capacity is optimally nurtured.

In Holland, very often the opposite approach is preferred. At the top, some preferred research areas are chosen, and the individual's application comes second. This solves one of our problems, namely that research takes place in a much more orchestrated way, but on the other hand, it is not unthinkable that an individual researcher's talents and aspirations are obstructed. Furthermore, Holland can guarantee a critical mass, which sometimes Belgian research cannot. But on the other hand, our approach gives more room to a multitude of research areas.

In a company, research results can be measured by their influence on revenue and profits. It is of little importance if the research itself was good or not good, as long as it generates profit. Obviously, this criterion is of no use in measuring university results. There, research quality is practically the *only* valid criterion. Therefore, measuring research management, or knowledge management, is for the most part quality management. Leuven University takes research quality very seriously. It has direct consequences in many areas. For instance: part of the internal funding system is directly influenced by the quality of the research output.

Since research, or knowledge creation, is a very complex process, it can't be managed by traditional (industrial) tools that make the direct ratio of inputs and outputs. Academic research, which aims to extend the frontiers of knowledge, has a very particular nature:

- it is performed in an environment which supplies 'academic freedom', guaranteed by the tenured appointment.
- Second, it includes high scientific or economic risks, and it even has 'the right to fail'.
- And third, skills, attitude and motivation belong to the most important input of the process. For these reasons, quality management can't be limited to a mathematical model. It should be performed through specialized committees.

Leuven university makes use of several such committees, all established in order to safeguard our university's research quality. One of them is the office of research coordinator. This office supports the Research Policy Council for general research policy, as well as the Research Council, which looks after the evaluation of research proposals. In turn, these councils advise the academic authorities on research policy and on the allocation of the university's own research funds. These limited resources are of great importance in the university's pursuit of a clearly defined research strategy.

The research coordinator also provides the K.U.Leuven research community with information and practical help relating to research programs, scientific prizes, new initiatives, etc. Much of this information is provided on our university's research web site.

Since more than 90 % of the research funding at K.U.Leuven is related to project and contract research, a strict follow-up procedure is required for each endeavour. This internal quality assessment is organized at different levels:

- First, the Research Council evaluates more than 500 proposals per year, all in English, for projects and scholarships. The Research coordinator organizes a peer review of the proposals, prepares the meetings of the Research Council, and - when the assessment procedure is finalized - provides essential and instructive feedback to the researchers.
- Second, publication output is monitored individually and on the level of the research group. The Research coordinator participates in efforts for international benchmarking of research. Obviously, publication analysis is an important instrument, not only to evaluate the success of a project, but also in appointment or salary decisions.
- And third, a review of the principles of 'good practice' is under preparation. Particular emphasis is put on the functioning of the research departments and on the improvement of the coaching of doctoral students.

Research, or knowledge creation, is a key factor for a university to give tangible content to its responsibilities, within the stakeholder view of our place in society. A university is not only committed to providing a good education and to performing good research for their own sake, but also because this is one of the most important ways to return something to society at large which grants certain privileges to universities.

I could mention many more aspects of research management, which in my opinion is entirely synonymous with knowledge management. I am referring to important matters such as the relationship between fundamental and applied research, the delicate balance between individual and collective rights to intellectual property, the difficulties in measuring the weight of research results by means of bibliometrics, and so on.

I would, however, like to conclude my survey of the three tasks of a university - service to society, education and research. And I would like to complete my contribution with a short survey of some ways to improve a university's handling of knowledge management.

## 6. Ways to improve university knowledge management

If it is true, as I have suggested, that a university is a knowledge institution, then almost any of its policies could be considered as ways to improve its knowledge management. I will just hint at a few important possibilities. I won't go into concrete details, but I will limit myself to a few very general ideas.

- First, universities should draft a mission statement, clearly defining their three basic and interrelated duties. This document should be thoroughly discussed by the various levels and entities within the university, but also by the university's various stakeholders.
- Second, an awareness should be created concerning the responsibility and accountability of the university members towards the university's stakeholders.
- Third, it could be argued that most universities have a structure which is relatively hostile to interdisciplinary developments. This is strange, since most of society's major problems require an interdisciplinary approach (just think of ecology, for instance), and many of our current scientific breakthroughs seem to be taking place precisely on the borderlines between disciplines. Looking at it from that angle, our traditional division in faculties, departments etc., often with their very own policy-making authorities, might qualify for a thorough rethinking.
- Fourth, if a university is a knowledge institution, it should make sure that the rest of the world understands that *information technology* is not the same as *knowledge management*. Information technology is a highly important development, but buying more computers is no guarantee at all for better knowledge systems or better knowledge-based results.
- Fifth, knowledge is, by its very nature, immaterial and not limited by physical or political boundaries. Therefore, universities should increase their international openness. Luckily, the Bologna Agreements, which are being implemented at this very moment, open up exciting new perspectives.
- Sixth, if our students are the key players in today's and tomorrow's knowledge society, it is vital that we prepare them as much as possible for the material and immaterial requirements of this knowledge society.
- Seventh, if a university is a knowledge institution, it is of vital importance that we welcome thorough and open evaluation. If the results of this evaluation are negative, we should develop a climate which is open to accepting even the most unpleasant consequences, *even* if these consequences would interrupt the cherished tenured appointment.
- Eighth, universities should stop considering themselves as highly individual institutions. This attitude hinders institutional collaboration, which will become more and more essential in tomorrow's world. What is true on the institutional level, is also true for each individual. Professors and students need to learn how to work together, in order to strengthen the total research quality and the overall level of academic performance. Universities still are not sufficiently aware of their place *in* society, which would automatically lead them to an increased and essential sense of responsibility and accountability. This is especially true in our current internationalized world. Modern universities are an integral part of what is called the *European higher education and research area*. In a knowledge economy and a knowledge society, universities are the

protagonists in providing the community, i.e. their stakeholders, with a competitive edge, both locally and globally.

## **7. Epilogue**

Looking at knowledge management from a university's point of view is, in fact, looking at the very heart of that university. It forces us to consider our threefold mission from a very modern perspective. I am quite sure that I have not been able to cover everything, but I do hope that I have been able to give some insight into our threefold mission - service to society, education and research - which are essential in today's knowledge society. It is my firm belief, then, that universities will continue to play a major role in tomorrow's world, assuming that they are willing to assume their considerable responsibility.

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