

# The General Concept of Benchmarking and its Application in Higher Education in Europe

JOANICJUSZ NAZARKO, KATARZYNA ANNA KUŹMICZ, ELŻBIETA SZUBZDA-PRUTIS AND JOANNA URBAN

*The purposes of this paper are twofold: a presentation of the theoretical basis of benchmarking and a discussion on practical benchmarking applications. Benchmarking is also analyzed as a productivity accelerator. The authors study benchmarking usage in the private and public sectors with due consideration of the specificities of the two areas. Special attention is paid to the presentation of the current picture of higher education and conditions for the application of benchmarking. The chosen examples of benchmarking projects conducted in higher education illustrate the spectrum of benchmarking usage. The authors conclude the paper with a recommendation for the employment of benchmarking in the higher education environment, especially in the light of competition pressures and rapid economic development.*

## Introduction<sup>1</sup>

Benchmarking is a tool applied both in the private and public sectors. It was originally intuitively used in business via the observation of partners and competitors and the adaptation of their good practices. The first formalized benchmarking activities were carried out by the Xerox Company in 1979. It was the marketing manager of Xerox, Robert C. Camp, who published the first monograph devoted to benchmarking in 1989 (Camp, 1989). Later benchmarking became very popular among Japanese businessmen and consequently all over the world.

In the private sector, benchmarking is mainly applied by benchmarking consortia, making comparisons on the basis of principles set by companies specialized in benchmarking which offer their service as benchmarking moderator and also provide access to benchmarking databases. Benchmarking in the private sector is perceived as a tool for increasing productivity and accelerating changes. It facilitates strengths and weaknesses identification and delivers solutions checked by others.

Gradually, public institutions appreciating the benefits of benchmarking also began to apply the practice to their activities, making necessary adjustments according to individual circumstances. Benchmarking was also recognized as a tool for increasing productivity, competitiveness and improving quality of didactics and scientific research, in higher education and has been successfully employed by many universities in the USA and Australia in recent years. In Europe, benchmarking can be seen as a response to the postulate of the Bologna Declaration which was signed in 1999 by

<sup>1</sup> The paper was prepared in the course of the project, "Benchmarking in Higher Education", coordinated by the Polish Rectors Foundation. Available at <[http://www.education-benchmarking.org/storage/documents/Jerzy%20Woznicki\\_Benchmarking%20in%20the%20Higher%20Education%20System%20in%20Poland.pdf](http://www.education-benchmarking.org/storage/documents/Jerzy%20Woznicki_Benchmarking%20in%20the%20Higher%20Education%20System%20in%20Poland.pdf)>.

twenty-nine European countries in reply to new challenges in European higher education.

The Bologna Declaration called for the enhancement of the international competitiveness of European higher education institutions (HEIs) in the world. Moreover, the Declaration emphasizes the need for more comparison, transparency and visibility of quality in higher education, and benchmarking is increasingly considered a tool for drawing comparisons, and thus encouraging competition between HEIs.

## The Term, Aims and Classification of Benchmarking

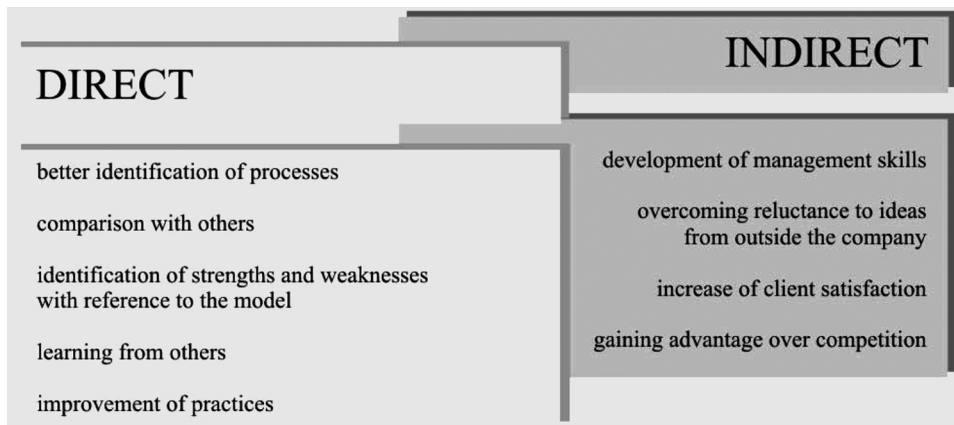
The literature on the subject of benchmarking identifies multiple definitions of benchmarking. They highlight the complexity of the problem and specificity of benchmarking in different areas of its application.

Karlöf and Östblom (1993) perceive benchmarking as a continuing and systematic process which involves confronting the effectiveness measured by productivity, quality and experience with the results of those companies and organizations which can be seen as a model of perfection. Camp (1989) defines benchmarking as an instrument steering competitive processes. The author of the latter definition implies that benchmarking is a search for the most effective methods for an organization to gain the advantage over its competitors. Universal and applicable to different benchmarking undertakings is the definition by Pieske (1994), who describes benchmarking as a method of searching for model solutions to gain the best results by learning from others and benefiting from their experience. This definition highlights the most important and indispensable pillar of benchmarking: learning. It should be indicated that the essence of benchmarking is first and foremost the identification of best practices and their creative adaptation, without simply copying. The continuity of the process is also of great importance.

The direct aims of benchmarking include: identification of better processes, comparisons with others, identification of strengths and weaknesses with reference to the ideal model, learning from others and the improvement of practices. Indirect aims of benchmarking embrace the development of management skills, overcoming reluctance to ideas from outside the organization, an increase in client satisfaction and gaining the advantage over the competition (Figure 1).

The types of benchmarking derive from the aims (Figure 2). According to the subjective criterion, benchmarking can be internal (inside the company – enterprise benchmarking; or inside a company group – corporation benchmarking) and external (competition, branch and branch-independent). Internal benchmarking is applicable in big organizations with complex organizational structures, since there is a possibility to compare different departments with each other. External benchmarking requires comparing organizations and productivity with direct competitors (competition benchmarking) or with organizations of the same branch (branch benchmarking) and/or with any organization regardless of the branch (branch-independent benchmarking). Taking into consideration the subject of benchmarking, the following types can be distinguished: product, process, strategic and organizational. Product benchmarking involves comparing products of different companies, for instance market share or effectiveness of client service. The comparison should be treated as a way to facilitate further analysis which would help the organization become the leader in its field. The most common areas for

FIGURE 1. AIMS OF BENCHMARKING



Source: The authors.

benchmarking are the comparison of procedures and processes of organizations, while strategic benchmarking compares actions taken at a strategic level, to support the long-lasting advantage over competition through strategic knowledge supply. Organizational benchmarking on the other hand is most commonly used in restructuring processes in developing organizations.

Benchmarking can be applied at different levels (Figure 3), starting at the company level drawing conclusions from current successes, then borrowing good ideas and defining an innovative application of best practices in the organization via comparison with branch standards, to achieve national or world leader status.

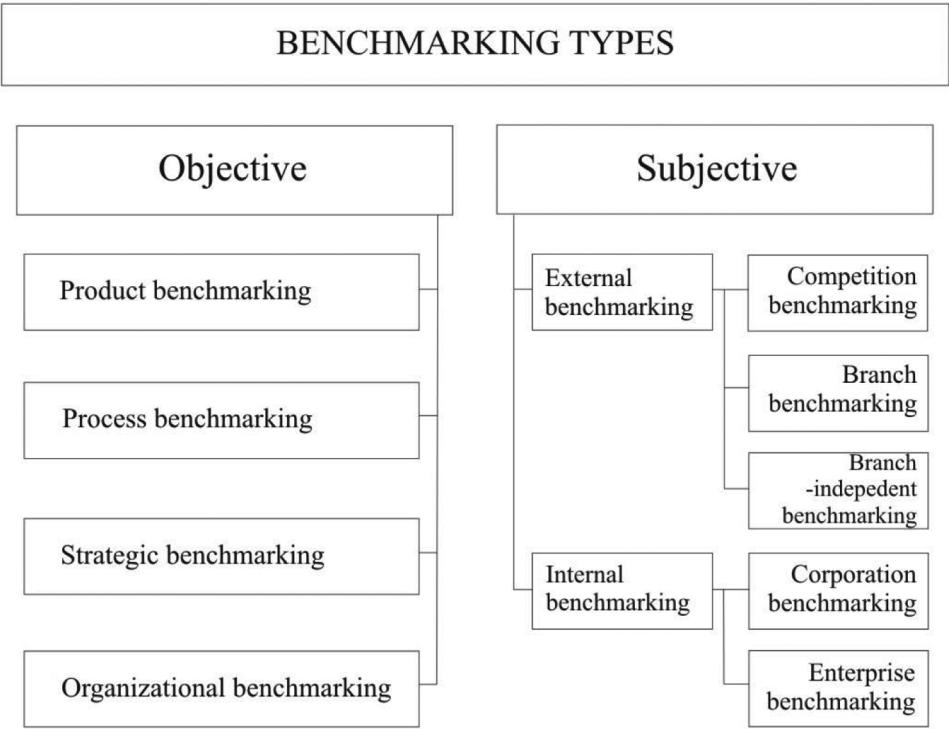
When the range of a benchmarking undertaking increases, more complex benchmarking processes should be anticipated, and the more time, knowledge, skills and resources will be needed.

When discussing the meaning of benchmarking in higher education, it should be strongly emphasized that the ranking of HEIs is *not* benchmarking. Rankings simply classify HEIs without fulfilling the basic benchmarking principle which is to indicate best practices and to provide ways to improve, develop and learn.

According to the terminology used by the European Network for Quality Assurance in Higher Education (ENQA) (Hämäläinen et al., 2002), benchmarking is always improvement-oriented. From this point of view, rankings of HEIs could be considered only as the initial stage in the benchmarking process. They indicate benchmarks and benchmarking gaps between institutions, but they *do not* indicate ways for improvement.

Before embarking on a benchmarking initiative the following pre-requisites should be taken into consideration: first, benchmarking should be seen as just one of the basic pillars of learning organizations because it encourages careful observation and learning from others; second, as a process of learning from others it requires modesty, since without this it is impossible to acknowledge areas where others out-perform your organization; third, benchmarking does not mean uncritical copying, which could be irresponsible when an organization does not understand the essence of its own, individual conditions; fourth, benchmarking should not be limited to comparison for the purposes of ranking.

FIGURE 2. BENCHMARKING TYPES



Source: Derived by the authors, based on InnoSupport (2005).

It is worth remembering that the barriers to good benchmarking practices are first and foremost inside the organization.

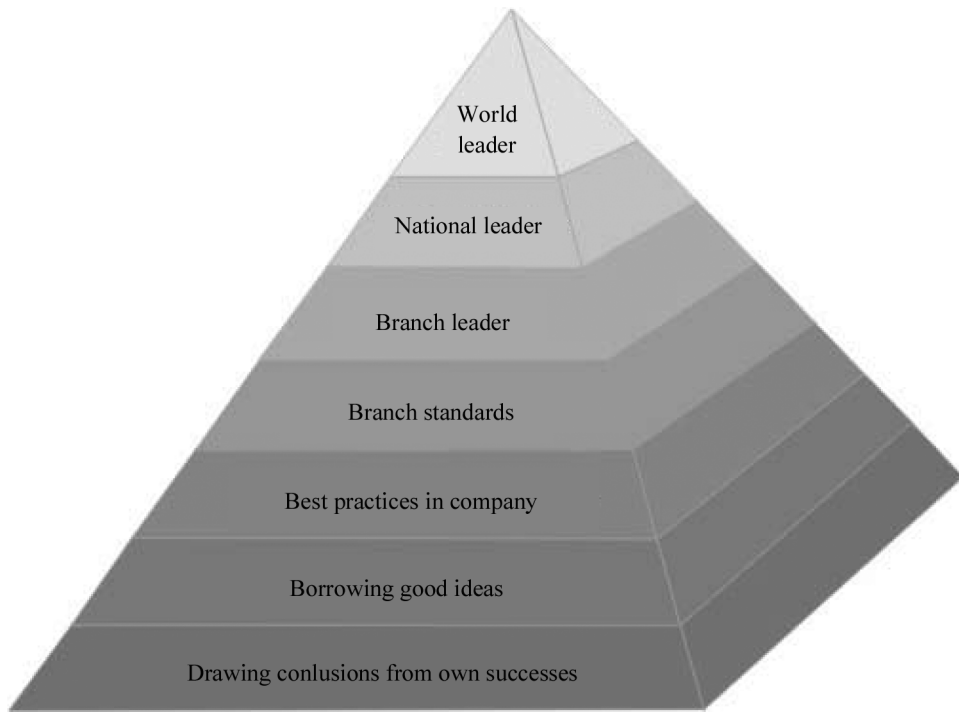
### Benchmarking Phases

In the literature on benchmarking, different methodologies describing the course of benchmarking process are presented. The methodology of Anderson (1995) is universal and easy to adapt to the individual project. It includes five phases of a benchmarking project: planning, searching, observation, analysis and adaptation (Figure 4).

The first phase is planning. It is a very important point, because it determines project success, and is a time consuming phase. According to Anderson (1995) it includes four stages. The first stage is the choice of the benchmarking process. Next is the constitution of a benchmarking group, an understanding and documentation of the benchmarking process and a determination of an effectiveness measure of the process.

The second phase of the benchmarking process – the searching phase – includes identification of benchmarking partners. In this phase a list of criteria to be met by a potential benchmarking partner is prepared. Potential partners should then be identified and the most suitable partners to the specific benchmarking task chosen. The second phase concludes with establishing contacts with partners.

FIGURE 3. LEVELS OF BENCHMARKING



*Source:* Derived by the authors, based on Bogan and English (1994).

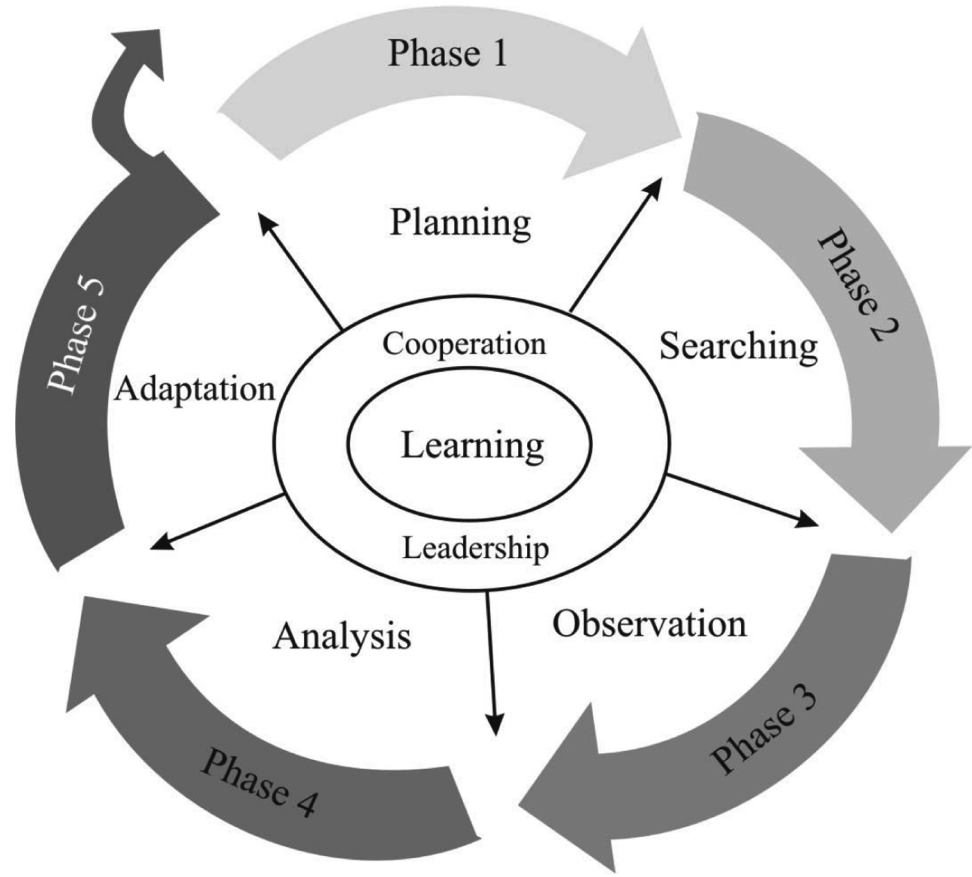
The third phase is observation. The aim of this phase is to gain the information necessary for the analytical needs of benchmarking. Becoming acquainted with the processes and the effects of the processes taking place in the partner organizations is highly advisable. The observation phase includes the preparation of questionnaires, the receipt of data from partners, gathering documentation, and the checking and verification of the data. Particular attention should be paid to the reliability of all data.

The fourth phase of the benchmarking process – the analysis – includes the normalization of data, the identification of differences between indicators of effective processes taking place in the partner organizations and the identification of the sources of such differences.

The aim of the last benchmarking phase, the so called adaptation phase, is the preparation of a benchmarking realization plan, followed by the implementation of the plan, monitoring its development and reporting on it. The report serves not only as a documentation of the actions taken, but also comprises a set of recommendations for future benchmarking initiatives.

It should be stressed that the effectiveness of any benchmarking undertaking is highly dependent on the continuity and regularity of the benchmarking process. The benchmarking tasks should not be treated as a singular event. It is recommended to incorporate continually benchmarking as a regular management tool.

FIGURE 4. PHASES OF BENCHMARKING



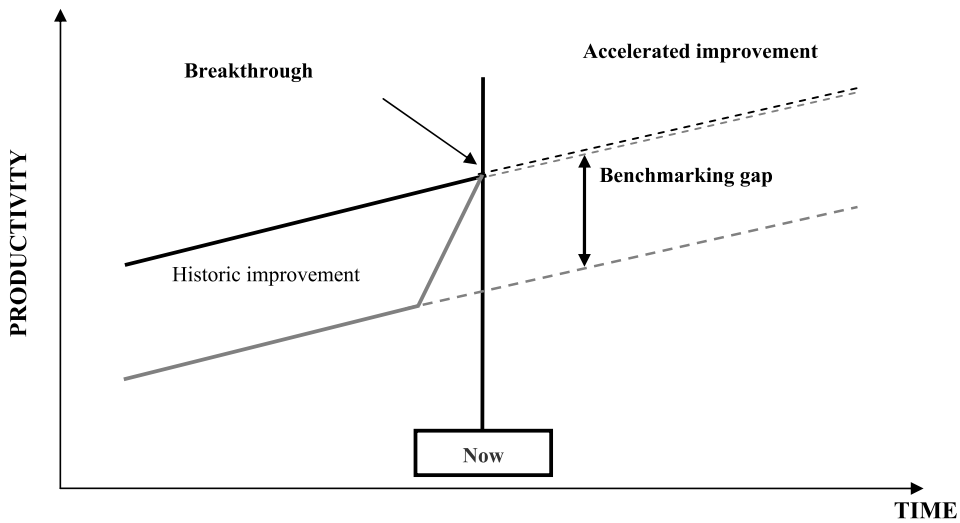
Source: Derived by the authors, based on Anderson (1995) and Garlick and Pryor (2004).

## Benchmarking and Productivity

The term ‘benchmarking’ in the commercial sector should always be linked with the imperative of productivity. The problem of the impact of productivity on economic growth was raised in the USA, at the beginning of the twentieth century. Nowadays productivity is often thought to be one of the main sources of economic growth, social development and improvement in the standard of living. In this context productivity is a socio-economic term, with a complex structure, the main aim of which is to optimize economic, public, administrative and institutional actions, with due consideration of given resources. Benchmarking should also therefore be seen as a tool to measure and accelerate productivity. Over time, benchmarking supports the acceleration of change, resulting in a tangible breakthrough in the development of an organization (Figure 5).

Benchmarking enables the identification of the gap between the productivity of one organization over the productivity of similar organizations. The aim is to reduce this gap

FIGURE 5. INFLUENCE OF BENCHMARKING ON PRODUCTIVITY



Source: Derived by the authors, based on PHS Management Training (2004).

through an increase in productivity, due to the implementation of practices indicated by benchmarking. After the identification of the gap the question arises whether an organization is able to remove such a gap entirely, only improve a little, or whether it is able to become the 'best-in-class'.

The real potential of the organization has to be estimated and an analysis be made of whether the desired effects are possible and within the budget at the disposal of the organization. The improvement of the areas of activity in which a benchmarking gap was identified and which the organization is unable to modify right now should become a long-term goal of the organization.

## Benchmarking in the Public Sector

Benchmarking in the public sector can somehow serve as a substitute for market forces, creating conditions supporting competition and encouraging modernization and improvement. It is especially important from the point of view of the specificity of this sector – i.e., largely, the non-profit sector – as the effects are rarely assessed from the perspective of productivity or the effectiveness of managing resources.

Benchmarking in the public sector is a difficult and troublesome task. The specific character of the sector is reflected in the benchmarking projects that have been conducted so far. This area is characterized by the complexity of environment influences and its instability (political and legal changes), the multitude and ambiguity of aims, the multitude of stakeholders and their contradictory expectations and preferences, as well as the fear of change and innovation. Benchmarking facilitates the overcoming of the problem of public sector assessment. By indicating the points of reference – benchmarks – the mechanisms of market competition are simulated.



In the public sector, benchmarking has for example been applied in the assessment of the functioning of cities, offices, hospitals, libraries, police stations, city transportation systems, schools and universities. The effect of benchmarking application has been the enhancement of the quality of the services offered, improvement of the effectiveness of public spending and the management of public institutions. Benchmarking can also help in a more effective allocation of public money.

The difficulties in applying benchmarking in the public sector, however, derive from the lack of a precise mission of an organization. There are also no objective standards for comparison. Scepticism, unwillingness to research and fear of defeat is common. There are also barriers connected with organization culture and probably first and foremost financial concerns.

Despite the aforementioned barriers, public sector managers more and more often employ benchmarking as a means to enhance competitiveness of the goods and service offered. There is an increasing pressure of corporate world tools and mechanisms on the public sector. As a result of legislation changes, public good users may choose from different suppliers, in turn forcing public institutions to improve their functioning. Pressures from local governments, local society and media, have stimulated public sector development and at the same time forced the use of modern management methods. The positive experiences of benchmarking initiatives in the public sector in many countries have encouraged benchmarking application in previously less willing contexts.

Numerous descriptions of benchmarking undertakings in the public sector can be found in the available sources. Braadbaart and Yusnandarshah (2008) assessed the past fifteen-year evolution of Public Sector Benchmarking (PSB) research, with a database of 147 peer-reviewed articles published between 1990 and 2005.

## Benchmarking in Higher Education

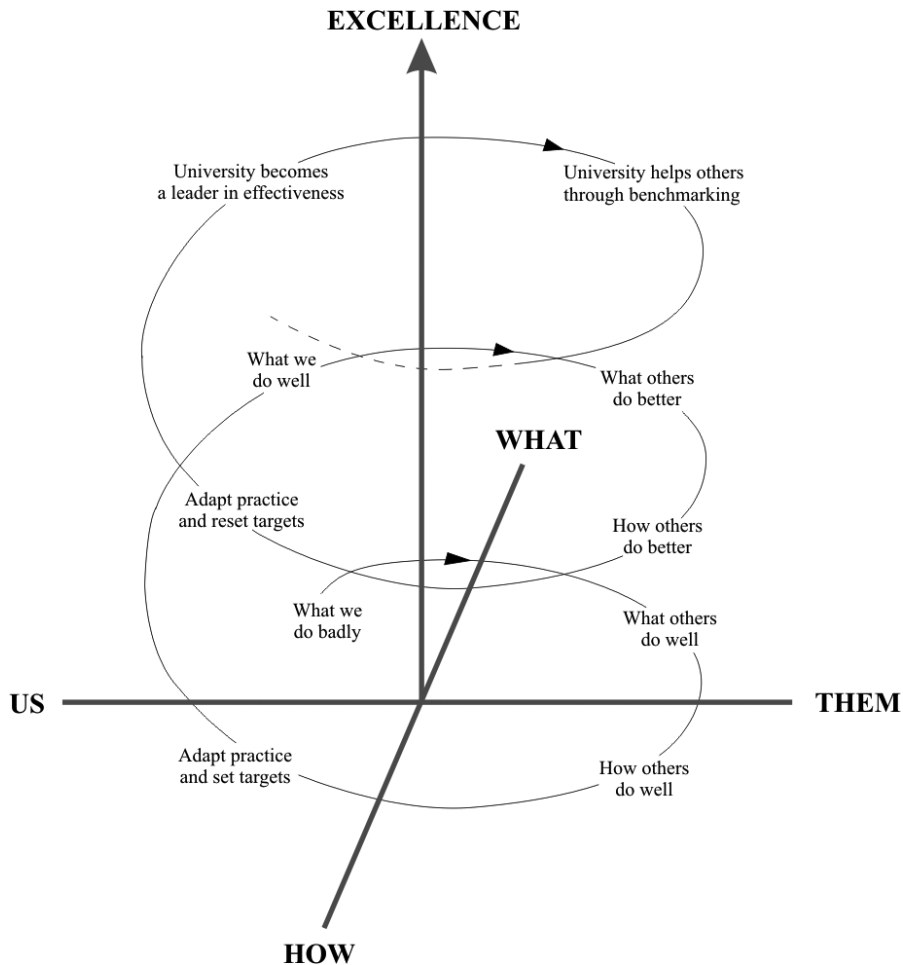
Similarly to other public sector institutions, in light of their well-documented challenges, HEIs are also increasingly interested in benchmarking. Higher education is currently undergoing many changes as a direct or indirect consequence of the growing expectations of the market. Such expectations are connected with the growing competition which provides students with the opportunities to choose from a wide range of educational offers from around the world. At the same time, a problem facing many HEIs is a decline in public funding sources. Competition between public and private universities is also growing, yet there are signs of competition inside the public sector as well (for example in Poland – competition between academic institutions and national vocational schools – which compete not only in terms of students but also in terms of public money and scientific staff). Competition in the non-public higher education sector is naturally also intensifying.

In the light of the challenges faced by all HEIs, they are being forced to respond by simply becoming 'better'. This does not mean excellence in all domains but it is becoming an organic component of the strategic development of many universities, with a sustainable ability for creating new knowledge and contributing to economic prosperity and the enhancement of competitiveness (Sadlak and Liu, 2007). Benchmarking is a vital component in achieving such goals.

Kelly (2001) propagates the application of the idea of a benchmarking spiral to HEIs (Figure 6). In this concept, benchmarking change starts with the analysis of bad



FIGURE 6. THE BENCHMARKING SPIRAL



Source: Derived by the authors, based on Kelly (2001).

performance of one institution by way of comparison with external good practices – observing how the examined processes are performed by other institutions and to adapt their practices to one's own activity. The task is to determine what we do well and what others do better. After examining these better practices we adapt them and reset our targets. Following this spiral, the university becomes a leader of effectiveness and, therefore, is able to share its model practices with others.

The aim of benchmarking in higher education is the improvement of the national or international competitiveness of universities. Benchmarking also enables the identification of processes needing improvement (inside the sector and inside the university), improvement of didactic, research, financial and administrative processes and a better adaptation of didactics and research to market demand. On the basis of published experiences, the development of cooperation between universities and gaining potential partners to other projects can also be included in the aims of benchmarking.

Benchmarking projects in higher education usually focus on the key processes from the point of view of the mission of the university, which means processes connected to didactics and the quality of education. In the literature of the subject, examples of benchmarking university libraries, administrative processes, processes connected with the management of university campus and university accounting are frequently presented.

HEIs often also benchmark informally through the exchange of experience in the framework of collaboration, through discussions in associations, at conferences of HEIs rectors, chancellors and finance officers (in Poland, the Conference of Rectors of Academic Schools in Poland (CRASP); and the Conference of Rectors of Polish Technical Universities (CRPUT); in the USA, the National Association of Colleges and University Business Officers (NACUBO). HEIs also form consortia dedicated to the realization of benchmarking project (collaborative benchmarking) and undertake benchmarking actions without the participation of other universities, for example through the purchasing of data from companies specialized in benchmarking or using online benchmarking tools offered by these companies (non-collaborative benchmarking).

It should be emphasized that in the literature on the subject there are insufficient descriptions of benchmarking undertakings, especially as far as the outcomes of benchmarking projects are concerned. Usually the documented information is incomplete and comprises only those elements that the partners have agreed to make public. This so-called 'closed shop' agreement means that only participants of the projects have access to data. This is a vital point of benchmarking agreement from each partner's interest point of view. The rules of trust and mutual availability of information, with the guarantee of not passing it to third parties, are often stated as strict conditions for cooperation in a benchmarking framework.

## Examples of Benchmarking in Higher Education

Benchmarking initiatives have been successfully carried out worldwide in Australia (Stella and Woodhouse, 2007), Canada (Proulx, 2007), the USA (Achemeier and Simson, 2005), China and Taiwan (Mok and Chan, 2008).

In Europe one project worth more focused attention is the European Benchmarking Initiative (EBI) (European Centre for Strategic Management of Universities [ESMU], 2008) headed by the ESMU in cooperation with the Centre for Higher Education Development (CHE), the UNESCO European Centre for Higher Education (UNESCO-CEPES) and the University of Aveiro. The project's objective was to improve benchmarking in higher education as a tool to modernize higher education management, to promote the attractiveness of European HEIs and create a European platform for benchmarking in higher education as a major instrument for collaborative learning to increase institutional performance. The EBI project provides a deeper insight into the mechanisms of benchmarking in higher education for a better understanding of the principles of true benchmarking. It was grounded to a considerable extent on an analysis of a selection of existing co-operative benchmarking initiatives and networks in higher education. This sample consisted of eighteen initiatives from different countries in Europe, Australia, Canada and the USA. The initiatives were scrutinized through questionnaires and interviews based on fourteen criteria (with some sub-criteria) in order to obtain a deeper inside view into the systems, the pitfalls, the advantages and the

challenges inherent to each, as well as to avoid assumptions based on pure desk research. It provided suggestions and guidelines useful for newcomers to the scene of higher education benchmarking and supported HEIs and policy-makers to realize better the Lisbon goals and the Bologna Process. Results from the EBI were incorporated into a second phase of the project (2008–2010) which includes the establishment of four benchmarking groups of ten HEIs focusing on key EU priorities: governance, university–enterprise cooperation, curriculum reforms and lifelong learning.

As a further example of previous benchmarking in higher education one may also refer to The Northern European Benchmarking Project. The initiative was established in 2006 for a three-year period and includes five northern European universities: the University of Aarhus (Westensee, 2007), the University of Kiel, the University of Bergen, the University of Göteborg and the University of Turku.

The partner universities are multi-faculty universities, with a broad range of scientific research and teaching. They share many similarities and face the same challenges both internally and externally. The main difference between them is their size.

The universities launched the cooperation in order to start a broader benchmarking process wherein they would be given the opportunity to learn from each other's best practices within different areas of interest. The themes to benchmark were chosen by the cooperating universities every year. In 2006 these were external research funding and management and international Master's programmes, while in 2007 the subject was PhD studies. In the academic year 2008–2009, the benchmarking exercise concentrated on the internal allocation of educational and research resources.

The external research funding and management theme was seen as important because research universities in Europe were facing a change in the way they were funded. The key issues that were addressed included: the development of an institutional research strategy; external funding procedures; submission and authorization of externally funded projects; project management and control; training of research staff; and commercial exploitation of research. The most important conclusions included the statement that all universities had a research strategy in place with very specific activities and goals, and that research strategies were tightly coupled to external funding. However, it also revealed that there were no formal systems for monitoring the progress of the research in the compared universities, and that the universities did not organize any training for key researchers and did not really have clear guidelines on what types of projects the institutions would be willing to accept.

When benchmarking international Master's programmes, special attention was given to the following issues: quality assurance; recruitment of international students; recruitment of staff; contents of the international Master's programme; international student support; marketing and joint Master's programmes. As a result of benchmarking in this area different scholarship schemes and approaches to deal with problems with joint degrees were identified. Moreover, joint marketing initiatives for the Baltic Sea Region were discussed and problems with accreditation of Erasmus Mundus programmes were addressed.

In the area of PhD studies, some of the key issues addressed were: recruiting and admission, supervision, instruction and courses, research ethics, monitoring and reporting, preparation of PhD thesis, entering work life. The main findings concerned ideas for international recruitment of the best students and for better supervision of PhD students. Moreover, conceptions of establishing and marketing alumni networks were discussed.

Among European countries, the UK might be considered a leader as far as benchmarking in higher education is concerned. The Higher Education Academy (HEA) and the Joint Information Systems Committee (JISC) Benchmarking and Pathfinder Programme are examples of a nationwide benchmarking initiative (HEA and JISC, 2008). The programme began in November 2005, and by July 2008, seventy-seven HEIs (including some Welsh and Scottish HEIs) had taken part.

The project's aim defined by the project coordinators was to build e-learning capacity and embed good practice into mainstream provision. The initiative provided occasion for analysis and reflection on e-learning processes, provision and practice. The scope of the project was not only limited to e-learning, it also embraced issues of quality enhancement and continuous improvement in learning, teaching and assessment areas. Participants of the programme followed one of two approaches: either to prove that institutions exercise e-learning properly or to improve their practices.

In recognition of the lack of definitive methodology for benchmarking e-learning and of the diversity and autonomy of the sector, the HEA decided to employ five methodologies as follows: ELTI (Embedding Learning Technologies Institutionally), MIT90s (developed by Massachusetts Institute of Technology in the 1990s), OBHE/ACU (Observatory for Borderless Higher Education/Association of Commonwealth Universities), Pic&Mix (developed by Professor Paul Bacsich, the programme's consultant) and eMM (e-learning Maturity Model).

The scope of the benchmarking task usually covered an entire institution, but sometimes because of time, staff or resource constraints it was limited to selected faculties, departments or programmes. The participants of the HEA and JISC benchmarking programme declared that the benefits from taking part in the undertaking included first and foremost the establishment of relationships between institutions, significant progress in understanding the e-learning process, raising senior management awareness of e-learning, focusing on the changing nature of the learning and teaching process and the facilitation of intra-institutional communication by forging relations between previously disparate groups. Benchmarking also highlighted the concept of a continuous cycle of review and improvement which should be embedded institutionally.

As far as constraints on the programme were concerned, timescales, staff availability and logistical and cultural barriers were enumerated. The project coordinators also highlighted that despite continued reassurances to the contrary, some institutions persisted in the assumption that the aim of the programme was to arrange a league table of e-learning which indicated the need for further clarification of the issue of trust in benchmarking in higher education.

## Conclusions

In the authors' opinion the application of benchmarking in higher education is appropriate and advisable, especially in the light of the pressure of competition, increasing demand and the dynamic development of economies. Benchmarking enables the identification of areas needing improvement and indicates good-practice practical solutions to the problems. Benchmarking initiatives can also contribute to the development of cooperation between universities. In global terms, benchmarking undertakings constitute a great opportunity for a whole higher education sector to contribute to the improvement of individual university operations and to the enhancement of the national quality of education.

On the basis of the available knowledge about practical benchmarking usage in higher education it can be assumed that benchmarking *supporting* processes, such as student admission systems, seems to be easier to apply than to benchmarking *strategic* processes, such as the effectiveness of didactics. Yet, European benchmarking initiatives carried out by groups or consortia of universities have embraced processes related to teaching and learning, quality management and administrative processes.

In Poland a national benchmarking project was started in 2007 by the Polish Rectors Foundation (FRP). Before this initiative, only pseudo-benchmarking activities and informal benchmarking (for instance, the exchange of experiences during the meetings of the Conference of Rectors of Academic Schools in Poland [CRASP]) were carried out. The essence of the project is to design and implement a benchmarking system dedicated to higher education. The FRP project aims to look at two benchmarking processes: e-learning and the quality assurance of didactics. The benchmarking system is expected to serve the agencies responsible for national higher education, HEIs themselves and potential employers as a source of reliable information. It is hoped that the effects of the FRP project will help Polish HEIs meet student and market expectations.

## References

- ACHEMEIER, S.D. and SIMSON, R.D. "Practical Considerations When Using Benchmarking for Accountability in Higher Education", *Innovative Higher Education* 30 2 (2005): 117–128.
- ANDERSON, B. "Benchmarking", in A. ROLSTADAS, ed. *Performance Management*. London: Chapman and Hall, 1995, pp. 211–265.
- BOGAN, C.E. and ENGLISH, M.G. *Benchmarking for Best Practices: Winning Through Innovative Adaptation*. New York: McGraw-Hill, 1994.
- BRAADBAART, O. and YUSNANDARSHAH, B. "Public Sector Benchmarking: A Survey of Scientific Articles, 1990–2005", *International Review of Administrative Sciences* 74 3 (2008): 421–433.
- CAMP, R.C. *The Search for Industry Best Practices that Lead to Superior Performance*. New York: ASQC Industry Press, Milwaukee Wisconsin, Quality Resources, 1989.
- EUROPEAN CENTRE FOR STRATEGIC MANAGEMENT OF UNIVERSITIES (ESMU). "Benchmarking in European Higher Education". Retrieved on 19 February 2008, from <<http://www.esmu.be/index.php?id=205>>, 2008.
- GARLICK, S. and PRYOR, G. "Benchmarking the University: Learning about Improvement". A report for the Department of Education, Science and Training, Commonwealth of Australia, 2004.
- HÄMÄLÄINEN, K., HÄMÄLÄINEN, K., JESSEN, A.D., KAARTINEN-KOUTANIEMI, M. and KRISTOFERSEN, D. "Benchmarking in the Improvement of Higher Education". ENQA Report for the Department of Education, Science and Training, Australian Government, Helsinki, 2002.
- HEA and JISC. "Challenges and Realisations from the Higher Education Academy/JISC Benchmarking and Pathfinder Programme". An End of Programme Review by the Higher Education Academy, Evaluation and Dissemination Support Team, 2008.
- INNOSUPPORT. "Supporting Innovation in SMEs". Retrieved on 8 May 2008, from <[http://www.innosupport.net/webhelp/wso/user/firma\\_3/enInnosupport.pdf](http://www.innosupport.net/webhelp/wso/user/firma_3/enInnosupport.pdf)>, 2005.
- KARLÖF, B. and ÖSTBLOM, S. *Benchmarking: A Signpost to Excellence in Quality and Production*. New York: John Wiley and Sons, 1993.
- KELLY, A. *Benchmarking for School Improvement: A Practical Guide for Comparing and Achieving Effectiveness*. Routledge, e-Library, 2001.
- MOK, K. H. J. and CHAN, Y. "International Benchmarking with the Best Universities: Policy and Practice in Mainland China and Taiwan", *Higher Education Policy* 21 (2008): 469–486.
- PHS MANAGEMENT TRAINING. "Benchmarking Training Article". Retrieved on 4 April 2008, from <<http://www.training-management.info/benchmarking>>, 2004.

- PIESKE, R. "Benchmarking: das Lernen von anderen und seine Begrenzungen" [Benchmarking: Learning from Others and Its Limitations], *IO Management Zeitschrift* 6 (1994): 19–23.
- PROULX, R. "Higher Education Ranking and League Tables: Lessons Learned from Benchmarking", *Higher Education in Europe* 32 1 (2007): 71–82.
- SADLAK, J. and LIU, N. C. "Introduction to the Topic: Expectations and Realities of World-Class University Status and Ranking Practices", in J. SADLAK and N. C. LIU, eds. *The World-Class University and Ranking: Aiming Beyond Status*. Bucharest: UNESCO-CEPES, Shanghai Ciao Tong University and Cluj University Press, 2007.
- STELLA, A. and WOODHOUSE, D. *AUQA Occasional Publications* Number 13. *Benchmarking in Australian Higher Education: A Thematic Analysis of AUQA Audit Reports*. Melbourne, VIC: AUQA, 2007.
- WESTENSEE, J. "Benchmarking Research Management", Research Global. Retrieved on 17 May 2009, from <[http://www.au.dk/benchmarking/themes0607/research\\_funding\\_and\\_management/westensee](http://www.au.dk/benchmarking/themes0607/research_funding_and_management/westensee)>, 2007.