

Improving the Quality of Higher Education in Central Europe: Approach Based On GAP Analysis

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Abstract

A growing social pressure on addressing the issues of quality in administration of educational institutions has resulted in various national and international initiatives focused on development of recommendations and procedures for assurance of quality of education. The topic is getting more urgent in the period of global recession when the impacts of the crisis are experienced even by school graduates who have difficulties to find their place on the labor market. The issue of quality and connection of education with practical requirements ranks among the central topics of a broad discussion in Europe and worldwide. The submitted paper presents results of an investigation of a potential use of a system approach, based on individual gaps identified in a GAP analysis and summarizes recommendations concerning assurance of the lowest possible differences between individual components of the methodology. It is based on decomposition of individual gaps - in the relations between educational facilities, practice and students - into three areas, specifically key questions, interpretation that can be used for university environment and a set of suitable tools for elimination of differences in the given gap. The approach has been adapted for the conditions of university education and the descriptions and explanations of the individual gaps were adapted to increase the potential of improvements based on the application of the GAP analysis.

Keywords: quality, higher education, Central Europe, GAP analysis, continuous improvement, quality tools

1. Introduction

Educational institutions in Central Europe, traditionally, in the long-term and more or less successfully, resisted various models of quality management. Sporadic implementations of ISO 9001, CAF or EFQM models did not launch an avalanche effect and benefits of their introduction only rarely resulted in permanent improvement of quality of education (Orsingher, 2006). The reasons were many (ENQA, 2009):

- efforts to improve quality in educational institutions mostly focus on organization management and administration,
- excessive reliance on recommendations given by various external consultants or commissions, without a provable pro-active involvement of internal interested parties,
- the willingness to improve approach to education needs to get to the very planning, implementation and inspecting of the activity or this is where the initiative should actually come from.

The importance of those reasons lead to analysis of various approaches to identification of the potential to improve approach to education. The approach must be based on a deep analysis and must reach all components, processes and resources of education. One of the suitable tools is the GAP analysis.

The efforts to develop the world's most dynamic knowledge economy, as declared in the Lisbon strategy, are based on the idea to develop the educational infrastructure and research (ENQA, 2009). Carriers of such activities are mainly universities. Educational systems of European countries have their characteristic features that come from their typical cultural, social and political conditions and any comparison of their quality is complicated (ENQA, 2009). There are several metrics for evaluation of universities, both national (criteria of accreditation boards) and international (CAF & education, ESG). However, there is no generally accepted or uniform approach used in this sphere. The reason is the very essence of quality – when it comes to services, the term of quality is fairly abstract, subjective and intangible (Grauzel' & Hrnčiar, 2003).

Quality means the degree of fulfilling requirements. The requirements may be of different nature (stated, generally implied, obligatory) and they may be imposed by various interested parties (ISO 9000, 2005). Due to the earlier mentioned reason of high diversity of educational systems it is impossible to declare that a particular approach to measurement of quality is the most appropriate. The best results, not only in measurement but also in assurance of quality at universities, are achieved through diverse quality tools and quality models that create preconditions for successful assurance of quality in this sector (Westerhijden, 2007).

Quality tools (even if one can hardly consider it a technical term) have, from the viewpoint of their purpose, comprehensiveness and demands, a broad field of application covering various areas of quality. A certain umbrella position in this category is occupied by two tools that have a system character – closed (standardized) system concepts (represented e.g., by ISO 9000 standards) and open system concepts (TQM) (Brennan, 1997). Comprehensive tools for evaluation of services (in general) include also the GAP model. The model provides the opportunity to decompose potential failure of the service (in our case failure of education) into five or seven areas (Grauzel' & Hrnčiar, 2003).

2. Method

The main purpose of this study was to investigate mutual links between individual components of the GAP analysis and, based on the findings, to propose a GAP model for the university environment. The GAP analysis is a relatively widely used approach for quality assurance processes in organizations that provide services (Franklin, 2006). However, it has been used only rarely in the university environment and the most frequent problems of its implementation include particularly its problematic interpretation (Bernhard, 2011). Based on assumptions described below the authors have developed a method that is illustrated in Figure 1.

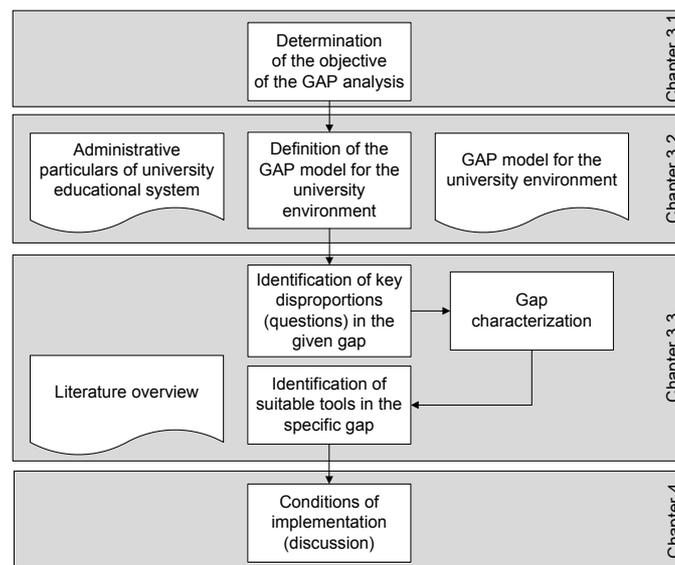


Figure 1. Process of GAP analysis

The selected solution framework was based on an overview of 29 literary references dealing with quality management and university education, while 307 approaches were reviewed with regard to their applicability, demands and potential benefits for elimination of the given gap. The evaluation of suitability of tools took into account the following facts:

- S_1 : the possibility to adapt the tool to the conditions of university institutions (used scale: 1 – low, 2 – medium, 3 – high)
- S_2 : added value in form of a gap reduction based on the use of a tool (used scale 1 – low, 2 – medium, 3 –high),
- S_3 : risk of tool misinterpretation (used scale 1 – high, 2 – medium, 3 – low),

$$S \text{ (suitability of the tool)} = ((S_1 + S_2 + S_3) - 3/6) * 100 \quad [\%] \quad (1)$$

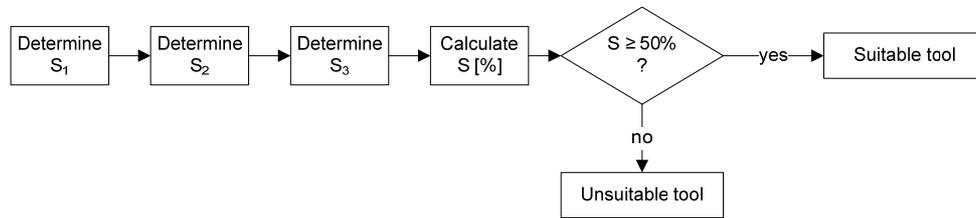


Figure 2. Sorting algorithm for quality tools

The sorting criterion was set at 50%, i.e. the tools were classified as suitable and unsuitable based on the previous algorithm.

The team that performed sorting of the tools for gaps reduction consisted of the following persons (each member is also a teacher at the university):

- Employees specialized in quality management: 2
- Representatives of faculty management: 3
- Employees specialized in educational process: 3

Each member of the team initially determined the value V1. Subsequently, the average of S1 values was calculated. The same approach was used for S2 and S3. The values were used to calculate suitability in % and the tools were classified according to the algorithm provided above.

3. Results

3.1 Specification of the GAP Analysis Objective

The GAP analysis is considered a comprehensive system approach and its focus and purpose reflect that. The approach is used to reduce disproportions that may occur in the entire process of service provision (starting from the design to measuring of impacts). The objective of the developed GAP model for university environment was to create an interpretation base for application of the tool in the university sector.

3.2 Definition of the GAP Model for the University Environment

The key step in developing the GAP method is to identify interested parties inside the educational institution (university) and in the external environment (customers), who are involved in provision of the service – education. In general, two key groups may be identified as university customers (IWA2, 2003) – students or prospective students and employers who use the results of education in an intermediated manner. The two groups constitute the main representatives of the external university environment. The parties affecting quality of the provided education inside the university include the university/faculty management, guarantors of study programs, guarantors of individual subjects and teaching and administrative employees of the university /faculty. The resulting model is based on an interpretation that the product of education is a study program. A study program is a set of main subjects of study and its objective is to provide students with particular knowledge and skills within a certain field. The developed model is shown in Figure 3.

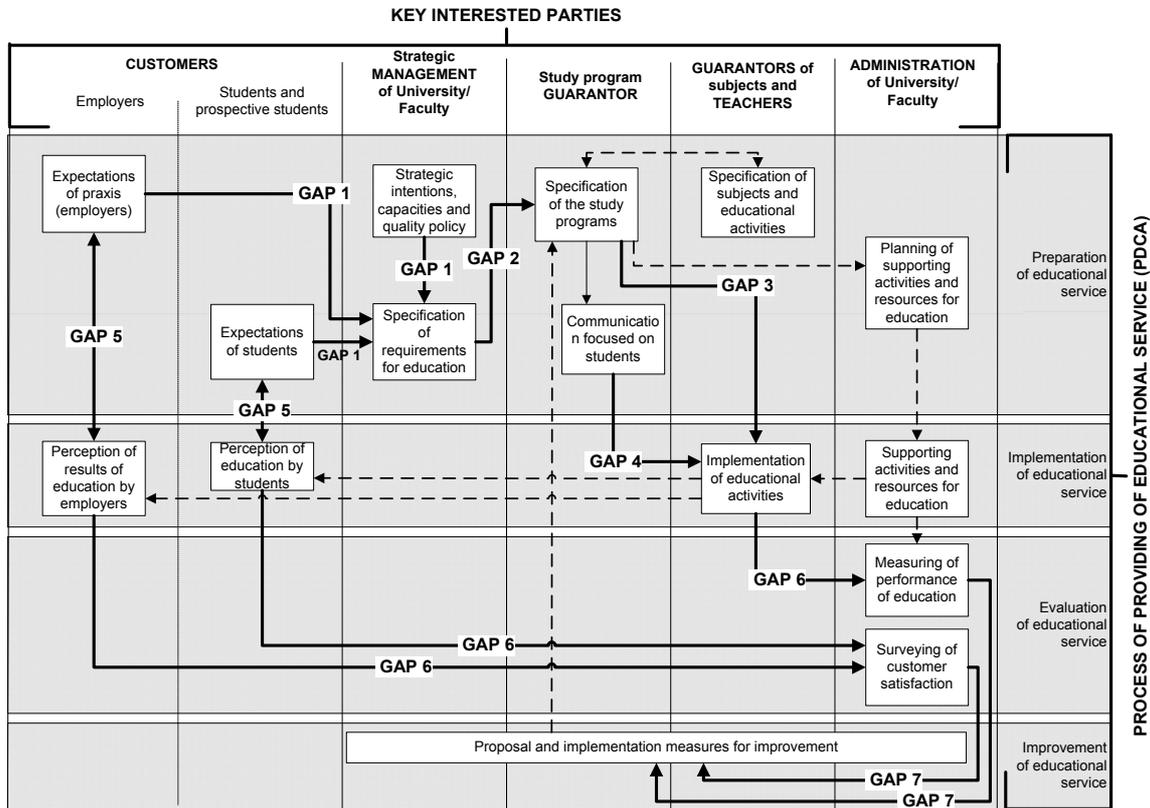


Figure 3. GAPS in process of providing of educational service

3.3 Results of GAP Decomposition

A retrospective model of GAP provides a view of the structure of quality of the service and can be used for educational services as well. The GAP analysis is a part of SERVQUAL, by now the best known and the most widely used approach in services sector (Rostášová, 2008). This relatively comprehensive approach describes a method to determine the quality of services. It contains definitions of quality criteria structured into questions that identify potential improvements of the services. According to the method, the potential improvements of the services have to be looked for in the area of criteria of services quality and in the following areas of the GAP model that are described in general, including examples of analytical questions relating to a specific area (as developed by the authors):

3.3.1 GAP 1 – Expectations of the Customer (Student/Employer) and Perception of the Requirements by University/Faculty Management

• Key questions:

- 1a) Were the tools used for identification of requirements of students, employers and other relevant interested parties appropriate?
- 1b) Were the identified requirements reviewed by the management?
- 1c) Was sufficient attention paid to suggestions submitted by the contact personnel?

• Interpretation:

The identification of customer requirements is required in all approaches to quality management, while the requirement is defined in ISO 9000 as “needs or expectations that is stated, generally implied or obligatory” (ISO 9000, 2005). When preparing a study /educational program and planning educational resources educational institutions seek to observe requirements of the customers, both from among the employers and prospective students. This requires appropriate identification of the target groups (segment) or subgroups and their requirements for education.

However, the identification of requirements of customers of educational institutions is a fairly complex task due

to several reasons. On one side, the complexity results from the character of the customers because the ability of prospective students to define their professional requirements is very limited and the employers primarily concentrate on requirements that often only reflect the current demand of the labor market but such requirements may be no more valid at the time when the student graduate. On the other hand, the complexity of identification of requirements for education is caused by the fact that the process is not sufficiently institutionalized. There are relatively few analyses available that would cover the entire society and, on the top of that, advanced educational institutions are interested in providing education with regard to the latest scientific findings.

Each educational institution needs to establish a sufficient apparatus to identify requirements of the interested parties and the related analyses and surveys (Brown, 2004). Each educational institution also needs to clearly define the values and strategic plans, to identify its own capacities, quality policy and quality objectives that will influence the set requirements for its educational program.

- *Suitable tools and approaches to eliminate GAP1:*

Table 1. Suitable tools and approaches to eliminate GAP1

Quality tools/approaches	S	Purpose	Outputs for GAP	Link to a question
KANO model	70,0%	Identification of customer requirements and their relevance	Prioritized list of customer (student/employer) requirements (quality characteristics), including weights of their importance; Records from a review of completeness of the list of requirements	1a)
Focus groups	58,3%			
Interviews with individuals	85,0%			
Questionnaire	88,3%			
Critical incident technique	75,0%			
Management review (ISO 9001 – chap. 5.6)	70,0%	Determination of suitability, adequacy and effectiveness of the given subject in achieving the specified target	Report from the management review containing a list of decisions aimed at improvement of education based on the identified requirements	1b)
Involvement of contact personnel in planning of educational services (ISO 9001 – chap. 7.1)	71,7%	Assurance of interactive character of the quality management of educational services	Set of customer (student/employer) requirements obtained from personal contact in the course of process of provision of education	1c)
Approach “bottom-up”	95,0%	Involvement of employees at the lowest management level into the process of development of study programs		

A number of tools and procedures with diverse scope of utilization may be used to identify requirements of the customers (students/employers). Examples of the use and focus of suitable procedures are shown in Table 1.

3.3.2 GAP 2 – Perception of employer/student requirements and their translation into specifications of study programs and educational process

- *Key questions:*

- 2a) Were the specified objectives of education related to the employers/student requirements?
- 2b) Were appropriate study resources, means and procedures planned to meet the specific requirements?
- 2c) Were competencies of pedagogical employees identified to meet employer/student requirements ?

- *Interpretation:*

The analysis of the second gap in the GAP model investigates the process of translation of requirements of the interested parties into specification of educational programs. This is a key process whose output is a proposal of an educational program and specification of educational resources. The educational program in this context is perceived as a comprehensive product of educational institutions offered to customers – students – who seek to increase their value (educational level) by graduating. This may subsequently ensure their self-fulfillment and success on the labor market.

From the viewpoint of quality management in education the owner of the process of study program development is a specialist (e.g., study program guarantor) who is responsible for development of the study program (Middaugh, 2009). Even if collective decision-making prevails in educational institutions (scientific boards, senates, advisory bodies), in the sense of quality management the process owner has the supreme responsibility for correct development of a study program, for quality of its outputs and is naturally also responsible for expedient proposal of resources for implementation of the educational program. On the other side, the owner should also have powers to decide which resources should be assigned to implementation of the study program. The most important resource are pedagogical employees who teach the knowledge and skills to students. Other important resources are premises, facilities, means and aids supporting the educational process.

The output of the process of educational program specification is a developed, approved and documented structure of the educational program, including the structure, scope and form of individual educational activities (curricula of the subjects) and also the assigned and available resources for implementation of individual educational activities.

This stage of the GAP model, apart from the educational program, also analyzes suitability of the specified rules and principles in the course of implementation, inspection and innovation of the educational program.

This part of the analysis also identifies all significant measurable indicators with required target values to be achieved through implementation of the educational program. Further, it should be noted that the educational program is a product which needs to be continually updated and adapted to the latest scientific findings.

• *Suitable tools and approaches to eliminate GAP2:*

Several procedures may be used to analyze options of failed service in GAP 2 and some of them are shown in Table 2.

Table 2. Suitable tools and approaches to eliminate GAP:

Quality tools/approaches	S	Purpose	Outputs for GAP	Link to a question
Development of quality policy and quality objectives (ISO 9001 – chap. 5.2; 5.3; 5.4.1; 5.5.2)	80,0%	Identification of orientation of the educational institution in the quality area	Set of quality objectives and their links to customer requirements	2a)
Work breakdown structure	91,7%	Decomposition of objectives of strategic nature	Breakdown of quality objectives into partial objectives (easier measurable and controllable)	
Value control chart	65,0%	Visualization of differences between costs of meeting the customer requirements and their importance	Set of recommendations concerning assignment of resources to individual educational activities	2b)
Resource management (ISO 9001 – chap. 6)	65,0%	Identification and management of resources necessary to ensure the educational process	Document showing the structure of resources assigned to individual educational sub-processes	
Competence tables (social competence index)	95,0%	Representation of an overview of competences of the individual teachers	Overview of assigned competences of the given teacher to meet customer (student/employer) requirements	2c)

3.3.3 GAP 3 – Specification of Study Programs and Educational Process and the Actually Provided Education

• *Key questions:*

3a) Is the education provided by pedagogical employees with required competencies?

3b) Are pedagogical employees evaluated based on results of the education and the method of its achieving?

3c) Are the study resources, means and procedures used in the educational process adequate to the requirements?

• *Interpretation:*

The third component of the GAP analysis focuses on evaluation of whether the educational program is implemented in conformity with the specification. Deviations from the planned and actual implementation may be caused by objective and subjective factors. The most significant objective factors include insufficient level of the incoming students, lack of resources needed for the equipment and support of the educational program. The subjective factors that can be addressed inside the educational institutions include insufficient observation of program/subject specification by a pedagogical employee (the employee does not teach what has been planned but teaches only what he/she can manage), failure to observe the required content and form of learning the knowledge and skills, too low or too high demands on students, loss of links between individual subjects that should follow up, weak involvement of students, missing educational activities as a result of disease or failure to arrange stand-ins, inappropriate approach to evaluation of students etc.

• *Suitable tools and approaches to eliminate GAP3:*

Several tools may be used for a deep analysis of potential disproportions between the proposed and implemented educational services, as shown in Table 3.

Table 3. Suitable tools and approaches to eliminate GAP3

Quality tools/approaches	S	Purpose	Outputs for GAP	Link to a question
Development of human resources (ISO 9001 – chap. 6.2.2)	70,0%	Assurance of professional growth of the teachers	Overview of pedagogical and professional competence structure of the individual teachers Plan to develop their competencies Description of the job and specialization	
Multi-criterion analysis	78,3%	Determination of teachers performance from various prospectives	Performance evaluation from the viewpoint of professional and pedagogical competencies	3a)
Internal benchmarking	85,0%	Comparison of performance of teachers groups (participating within one study program)	Overview of teachers performance from the viewpoint of professional and pedagogical competencies, their comparison and identification of the potential improvement of the individuals	
MBO	83,3%	Increased orientation on meeting of the objectives	Remuneration system based on fulfillment of the outlined objectives	3b)
Partial satisfaction surveys	83,3%	Determination of the scope of fulfillment of requirements in respect to tools and technology used in the educational process	Overview of fulfillment of customer requirements from the viewpoint of employed tools and technology	3c)

3.3.4 GAP 4 – The Provided Education and Communication with Students/Employers about the Education

• *Key questions:*

4a) Are pedagogical employees involved in the process of proposing of the form and content of communication activities?

4b) Do the objectives of communication oriented at employers/students focus on significant attributes of education and its results?

4c) Is external communication used to deal with situations concerning pro-active participation of students/employers?

• *Interpretation:*

The subject matter of the fourth component of the GAP analysis is communication with the customer before, during and after completion of educational activity in respect to the planned and implemented educational program. An analysis of this potential gap is fairly underestimated although many educational institutions have a

relatively high potential for improvement specifically in this area. This may be confirmed also by the fact that ESG standards for university education deal particularly with informing and communicating about the education, not only with students but also with all interested parties. This means that educational institutions, in addition to developing educational programs, should also create systems of communication oriented particularly at students but also at other important interested parties. A system approach to communication should be obvious not only from perception of importance of the task but also from its adequate implementation. Many educational institutions only “publish” necessary information for the students, either on their websites or notice boards. The analysis should investigate whether the communication system is appropriate and adequate and whether it actually meets requirements of the interested parties. The so-called student profile can be mentioned as one negative example of inadequate communication before the beginning of educational activity. The profile is often formulated for the purposes of accreditation of the educational program and it is presented to prospective students - secondary school graduates - in the same form in which it had been developed for a highly specialized commission and without any accompanying explanation. Similarly, students at the beginning of their studies or students already involved in educational activities sometimes find it difficult to understand certain references, terms and instructions issued by the student department. In case of incorrect form of communication the students can hardly feel as customers as the communication only stresses their obligations to the provider of the educational service.

Insufficient work with information in respect to general public and potential employers of the graduates of educational institutions, underestimation of presentation and promotion of achievements of the students, employees and the educational institution may lead to stagnation or decrease of confidence in the institutions, not only in the eyes of the general public but also in the eyes of the prospective students.

- *Suitable tools and approaches to eliminate GAP4:*

Several procedures may be used for a deep analysis of opportunities to improve quality of the services by means of this gap, as shown in Table 4.

Table 4. Suitable tools and approaches to eliminate GAP4

Quality tools/approaches	S	Purpose	Outputs for GAP	Link to a question
Communication with customer (ISO 9001 – chap. 7.2.3)	76,7%	Improvement of efficiency of communication by educational institutions with customers (students /employers)	Set of formalized procedures for external communication	4a)
Complaint management (ISO 10002)	70,0%	Instructions to the process of complaint management	Set of recommended procedures for management of complaints	
Targeted marketing (segmentation, targeting, positioning)	88,3%	Specification of communication strategies for identified segments	Set of target segments for individual study programs and specification of appropriate communication strategies	4b)
Service Level Agreement (ISO IEC 20000-1-2)	63,3%	Definition of the level of the service (education)	Set of specified relations and responsibilities for interfaces and sub-processes in education	4c)

3.3.5 GAP 5 – The Actually Provided Education and Its Results and the Education and Its Results as Perceived by the Student/Employer

- *Key questions:*

5a) Is it possible to achieve the same quality of education repeatedly or to improve it?

5b) Was the educational institution capable of responding to individual requirements of students/employers?

- *Interpretation:*

This gap investigated by the GAP analysis in the environment of educational institutions is very interesting. It is because it reflects most of the contradictions typical for educational institutions and perception of their quality by customers. The quality of education actually has relatively pronounced conflicting aspects of short-term and long-term nature.

An example of a short-term nature of the quality of education may be the positive perception by students who successfully passed exams or found the study relatively easy. They prefer this short-term perception and disregard potential chances to use their knowledge and skills in a business environment in the future. The long-term nature of the quality of education is more difficult to identify but it is more important and actually the only one that is important. It is expressed by the success of graduates in science or in business and, when they look back after a certain time, by what they think about truthfulness and validity of what they were taught and whether the mosaic of knowledge they acquired in the study program was useful and meaningful.

Meanwhile, GAP 5 is considered a function of the previous four ones, i.e. $GAP5 = f(GAP1, 2, 3, 4)$, and it expresses the baseline for improvement of quality of the service. The GAP model, through the areas mentioned above, thus focuses on one side on the conceptual proposal of the education and on the other side on the customer (employer/student). The customer is mapped from the very beginning, starting with the requirements for education, to his satisfaction with the use of the education and with the use of results of the process of education.

The experience with the utilization of the GAP model has led to its expanding with areas hiding other potential misunderstandings or improvements. The expanded GAP model, adapted by a group of authors from ASI (Graužel' & Hrnčiar, 2003) and identified as GAP 7, has included into the evaluated areas also identification of discrepancies from feedback at the interface employee – management.

- *Suitable tools and approaches to eliminate GAP5:*

Several procedures can be used for GAP 5, as indicated in Table 5.

Table 5. Suitable tools and approaches to eliminate GAP5

Quality tools/approaches	S	Purpose	Outputs for GAP	Link to a question
Process capability	55,0%	Determination of the scope of provision of a certain level of quality of educational service	Set of resulting values of capability indicators of educational service processes	5a)
Analysis of complaints and commendations	81,7%	Identification of structure of customer (students/employers) satisfaction with regard to their characterization	Overview of fulfillment of individual customer requirements	5b)
Conjoint analysis	53,3%			
Questionnaire	90,0%			
Multi-attribute methods	80,0%			
CSI	65,0%			

3.3.6 GAP 6 – Quality of Service Perceived by Customer and Related Quality Measurements

- *Key questions:*

- Do the indicators measuring performance of education correspond to the objectives of quality of education?
- Were suitable tools used to determine the level of satisfaction of students and employers with the education and its results?
- Are results of measurements of quality of education appropriately interpreted?

- *Interpretation:*

Educational institutions should have planned, implemented and maintained processes that provide for measuring, analysis and improvement of the management system. Measuring processes help to improve ability of educational institutions to quickly respond to impulses to changes (Anselmsson, 2001) (Hill, 2000). In order to improve the quality of education it is essential to ensure feedback from measuring processes. The basis for acquisition of data about the quality of education were the requirements for education, as identified in the course of specification of the educational program. Also interested parties were identified in this stage, whose requirements for the educational program were taken into account.

The feedback represents determination of the scope of fulfillment of objectives of the education, performed the viewpoint of customer satisfaction, as well as from the viewpoint of achieving the objectives (performance of

educational institutions). To explain the approach to identification of feedback, it is possible to use the so called quality cycle under the standard CEN 13816, which shows differences in the approach to determination of satisfaction and performance – Figure 4.

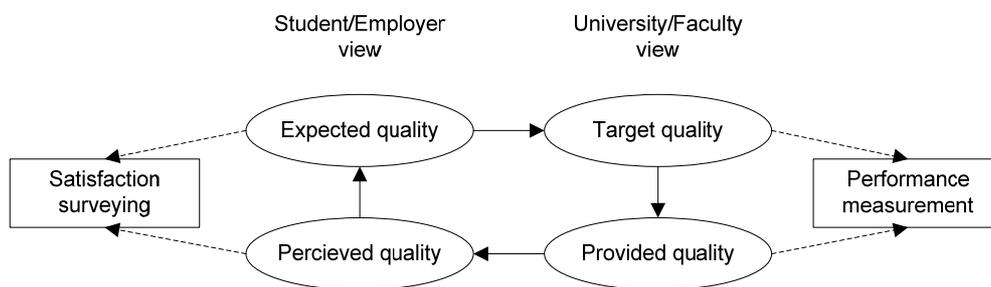


Figure 4. Loop of quality in higher education area (edited from CEN 13816)

When measuring quality, educational institutions therefore focus on two areas – the area of comparison of specified objectives and their achievement and the area of quality of provided education as perceived by customers.

The measurement of performance focuses on various areas. It may consist of one-off indicators, e.g., level of interest in enrollment into a particular educational program or structure of prospective students (from grammar schools or other secondary schools, appropriate results of prospective students, commuting distance). They may also include continual measurements concerning the process of implementation of educational activity or its completion. When measuring the performance of the process of education the educational institution focuses on measuring of indicators determined during specification of the educational program and its resources. The indicators focus e.g., on the following:

- preparation of educational activities – development and availability of information sheets of the subjects, use of e-education for lectures and consultations with students, informing of students, before the beginning of the educational activity, about the content and condition of taking the course, allocation of resources required for implementation of the educational activity, allocation of premises and time required for the process of education;
- course of educational activity – the level of conformity with the planned content, scope and form of educational activity, punctuality and availability of the pedagogical employee, functionality of equipment and resources;
- completion of educational activity – notification of dates of exams and evaluation, notification of results of evaluation of students, chances of graduates on the job market,

In order to determine satisfaction of interested parties, the expectations of the customer (student, employer) are compared with their perception of results of the educational program, as declared in the specification of the educational program in the form of a graduate profile. From this viewpoint it is necessary to determine their satisfaction with fulfillment of the requirements, as identified by the educational institution during preparation of the educational program specification.

In case of the target group of “employers” the task is relatively positively defined, although it is implemented with a relatively big delay after the identification of the requirements. Questions about satisfaction of employers with graduates should focus on the field of provision of required knowledge and skills in the given area and their ability of apply them in practical life.

In case of the target group of students it is not possible to determine their satisfaction with meeting of the requirements fully and equally for all students. It is necessary to discern between at least three categories of students – students who are attending the school now, graduating students and graduates with some practical experience. The identification of satisfaction should take into account the specific category.

The students currently attending the school should be asked to express their perception of quality of preparation and implementation of the educational program, as well as the evaluation system. The questions should concern fulfillment of the declared conditions, availability of resources (teachers, materials, premises), opportunity for involvement, satisfaction with the form and attractiveness of the presented knowledge, satisfaction with

supporting activities (administration, information).

The graduating students have a clearer notion about the evaluation of the completed educational program and they are able to express their perception of the educational institution as such and its quality culture, the structure, content and form of the educational program, the approach of teachers, provision of resources and, very importantly – most of them have confronted and compared their experience with their peers attending other educational institutions.

The graduates with some practical experience are the most significant target group to determine satisfaction from the viewpoint of feedback. They perceive and are able to determine the added value of a particular educational program, how it simplified their access to good and interesting jobs and what were the main benefits of the education or what lack of knowledge and skills they had to overcome to match other graduates on the labor market. However, to be able to investigate satisfaction of graduates with practical experience, it is necessary to maintain and to develop contacts with them.

The preparation, implementation and evaluation of measurements of satisfaction and performance is a complex task which should be performed in educational institutions at the required professional level.

- *Suitable tools and approaches to eliminate GAP6:*

Examples of potential use of procedures and tools for the GAP 6 analysis are shown in Table 6

Table 6. Suitable tools and approaches to eliminate GAP6

Quality tools/approaches	S	Purpose	Outputs for GAP	Link to a question
Balanced Scorecard	66,7%	Representation of a structure of performance of educational services	Linking performance indicators to quality objectives	6a)
Comprehensive multi-attribute measurement of satisfaction	vs. of 88,3%	Comparison of values of satisfaction obtained from two approaches to the measurement	Evaluation of correctness of tools measuring satisfaction by comparison of values of overall and aggregate satisfaction	6b)
Delphi method for interpretation of results and subsequent discussion	96,7%	Identification of potential discrepancies in interpretation of quality of educational services	Approved report about the achieved quality of the educational service and its structure	6c)

3.3.7 GAP 7 – Identified Level of Quality of Service and Measures Adopted by Management

- *Key questions:*

7a) Were appropriate measures identified to improve the service?

7b) Were appropriate measures consistently implemented in order to improve quality of the service?

7c) Is the impact of measures adopted by management to improve quality of education monitored, measured and analyzed?

- *Interpretation:*

On the condition that the surveying of customer satisfaction and performance of educational institutions was completed with adequate accuracy and consistently then the GAP model requires to analyze also the last area of potential failure – response to findings. Measurement of feedback by an educational institution makes sense only if the management seriously considers the findings and is prepared and capable of adopting appropriate measures (Sallis, 2002).

The management, including guarantors of the individual educational programs, has results of the measurements and other significant findings available, such as performance of the employees in science and research, results of satisfaction surveys among employees, economic results of the educational institution, including effective management of resources. It is up to the management's approach, consistency and abilities to respond adequately to the findings and to identify potential causes which need to be eliminated by means of appropriate measures.

Publishing of results of the measurements, particularly surveys of customer satisfaction, as well as publishing of the adopted measures, is extremely important for long-term involvement of students and the other interested parties into the process of getting the feedback.

Two additional areas in the adapted GAP 5 model make it possible to conclude the analysis of education from the viewpoint of the PDCA cycle, as the subject matter of the analysis is also the process of education measuring and improving. The meaning of GAP 5 is partly changed in the GAP 7 model, which in the original sense represents the only part of the model that can be affected by management of the organization only indirectly, through improvements of approaches in the other six areas.

• *Suitable tools and approaches to eliminate GAP7:*

Also in case of the GAP 7 analysis there are several ways (system approaches) that can be used and the most frequent ones are shown in Table 7.

Table 7. Suitable tools and approaches to eliminate GAP7

Quality tools/approaches	S	Purpose	Outputs for GAP	Link to a question
Continuous improvement (ISO 9004)	83,3%	Procedures to ensure satisfaction of interested parties and performance of the organization	Set of procedures to ensure continual improvement of educational institutions	7a), 7b)
Measuring of financial benefits (ISO 10014)	78,3%	Improvement of partial performance indicators of educational institutions	Set of procedures to measure partial indicators of performance in respect to objectives of the education	7c)

4. Discussion and Conclusion

The issue of quality of university education and implementation of system approaches to quality management at universities will continue to be the dominating topic of public and professional discussions in Central Europe. It is likely that new approaches will appear to assurance of quality in the university environment and that the existing approaches will be improved (Dew, 2004). It is also likely that such processes will not be isolated and will occur with necessary support from managements of national and international institutions, similarly as in the previous period – the projects will be supported from structural funds through the operational program “Education”, as well as by activities aimed at fulfillment of the national strategy for university education.

The potential of implementation of quality management systems with the use of range of quality tools in the university environment in the Central Europe is very high, however, its use is determined by the level of quality culture at the universities. The interest in improvement of quality of education, as declared by university managers, is a precondition for the success of such quality management systems, but it must be based on the principle of involvement of each individual teacher and university employee in the process of quality improvement. In general, it is possible to specify preconditions necessary for implementation of this approach in the university environment (ISO 9000, 2005):

- focus on students and employers and on their requirements,
- leadership approach to the university /faculty management,
- involvement of all employees,
- process-based approach,
- system approach to management,
- continual improvement,
- fact-based decision-making,
- mutually beneficial relations with suppliers.

In the university environment in the Central Europe the GAP model and its use by universities is fairly rare which is in contrast with benefits this approach may bring in the long-term:

Anticipated outputs (short-term perspective: 1 – 2 years):

- documentation of main and supporting processes of the university /faculty, with clearly allocated competencies and responsibilities,
- definition of key requirements of the interested parties, specification of criteria for evaluation of system

functioning,

- specification of procedures for verification of fulfillment of pedagogical objectives,
- specification of purpose and content of communication channels,

Anticipated results (medium-term perspective: 2 – 5 years):

- improvement of functioning of the internal management system (prevention of problems, transparent assignment of powers and responsibilities, preparation and implementation of education, ...)
- better understanding of requirements of employers and students and their transformation into the educational process,
- better ability to measure efficiency of education,
- reduced risk of incorrect interpretation of gaps between related processes of provision of education (GAP),

Anticipated impacts (long-term perspective: 5 years and longer):

- increase of the quality of education as measured by various external groups (region, accreditation board prospective student, employers),
- change in orientation of teachers on quality and on components contributing to quality,
- increased interest in enrollment in the given university,
- establishing of partnerships with key employers,
- more efficient use of resources intended for education.

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Appendix

Abbreviations and terms and their meanings

Approach "bottom-up"	Approach in which the requirements of customers (students and employers) are transferred to the strategy and policy of high school
Balanced Scorecard	Approach used by relation the vision and strategy to the operational objectives
CAF	Common Assessment Framework
Conjoint analysis	Approach to determine the sensitivity of the price (effort) for elements of service
Critical incident technique	Technique to detect highly positive and negative requirements, on the basis of positive and negative customer experiences
CSI	Customer Satisfaction Index
Delphi method	Widely applicable method using expert estimates
EFQM	European Foundation for Quality Management
Focus groups	Technique for detection requirements of predetermined group of people by a smaller group with the same characteristics
ISO 9000	International standard including basic principles of quality management and dictionary
ISO 9001	International standards including requirements on Quality management system
IWA2	International Workgroup Agreement
KANO	Model to break down the elements of quality to 3 categories: must-be, one-dimensional and attractive
MBO	Management by objectives
Multi-attribute methods	Method to determining the quality by product or service break down to attributes
PDCA	Deming cycle of continuous improvement (Plan-Do-Check-Act)
Service Level Agreement	Approach to set a level of service
SERVQUAL	Method to measure the quality of service
TQM	Total Quality Management
Value control chart	Tool to connect the perspective to the product by producer and customer
Work breakdown structure	Approach to decomposition problem (process) on the smaller, more manageable parts

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