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**BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS**

**Faculty of Economic and Social Sciences**

**Department of Management and Business Economics**

## **Thesis book**

Service quality measurement and evaluation in higher education – The improvement of a service quality framework for project work-type courses

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Budapest  
2021

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## **1. INTRODUCTION**

The number of research in the literature focusing on measuring, evaluating and improving the service quality level of the services provided by higher education (HE) institutions (HEIs) has been increasing continuously since the 1990s. The topic has been receiving growing attention due to the unique role of the HE sector; that is, higher education is one of the main drivers of social and economic development (Anttila and Jussila, 2017). The primary goal of HEIs is to transfer the knowledge that meets the rising expectations of the labour market so that graduates could get jobs matching their degrees right after graduation. Therefore, measuring service quality related to the complexity of this knowledge transfer process is one of the main challenges of all institutions (Jääskelä et al., 2020).

The primary aim of this section is to demonstrate the actuality of the research topic, to illustrate its relevance, to formulate and present the research questions, and to detail briefly the Hypotheses and the process of investigation.

### **1.1. Antecedents of the research**

The HE sector plays a significant role in the economy of every country. Therefore, its high-level, quality operation is crucial for the country's prosperity, so students do acquire up-to-date and high-quality knowledge to meet the increasing expectations of the labour market (Turzó et al., 2005; Csizmadia et al., 2012; Finna and Erdei, 2015; Berényi and Deutsch, 2018a). Thus, in both the self-assessment guide (2020) compiled by the Hungarian Higher Education Accreditation Committee (HAC) and in its foundation called ESG (European Standard and Guidelines, 2015) proposed by the European Higher Education Area, the evaluation of institutional performance and the level of service quality are of utmost importance as being part of the institutional management activities. However, the measurement and evaluation of performance is fundamentally influenced by the fact that the definition and the concept of quality in the HE sector are rather vague and difficult to determine (Anttila and Jussila, 2017) owing to the number of stakeholders, to their often unclear expectations and roles, and to the difficulty of segmenting direct and indirect, or primary and secondary customers of HE. Consequently, the provision of quality education and services has become a key element in the rising competition between HEIs for students and for funding recently (Csizmadia et al., 2012; Bedzsula and Topár, 2017).

The era of mass education brought along by the Bologna system makes it extremely challenging to customize the educational processes to students, to meet individual expectations, to transfer the knowledge that can be implemented in practice, to provide a high level service quality and to be able to measure and improve institutional performance in the long run. HEIs generally customize educational processes by providing classes in smaller groups, by incorporating case studies and real-life business problems, by incorporating project work-type courses and assignments into the curricula.

The measurement and improvement of the level of service quality could be carried out through various processes and frameworks specifically adapted to institutional features, for example by the traditional end-of-semester student evaluation of education (student evaluation of teaching), by the graduate career tracking system. Moreover, the HAC self-assessment guide (2020) and the ESG (2015) requires the identification of all stakeholders and their needs and expectations towards institutional operation, and HEIs are also expected to plan and implement the relevant institutional processes that allow the continuous monitoring of stakeholder expectations and satisfaction based upon which improvement actions could be identified.

After 2011, mainly due to the introduction of the minimum point limit and loosening of the minimum point limits (Csőke and Tóth, 2017) significantly affecting the field of social sciences there was a small decline both in the number of applicants and enrolled students in the Hungarian HE system. Since then, the numbers are broadly similar, but still very high. According to the data of the felvi.hu (2019, 2020) website, a total of 85,000 people has been enrolled by the Hungarian HEIs every year since 2012 (although in 2020 the number decreased to about 73,000). Its approx. 8-9% (10% in 2019 and 2020) is provided by three very popular bachelor programs, namely, Management and Business Administration (GM), Engineering Management (MM), International Business Economics (NG) and the master program of Marketing. The data collection and analysis related to project work-type courses presented in the Dissertation focused primarily on these programs.

These are some of the most popular business programs of the Faculty of Economic and Social Sciences (GTK) at the Budapest University of Technology and Economics (BME), and the curricula of all the aforementioned bachelor programs include several consecutive project work-type courses with which BME answers to some of the challenges highlighted above that HE should face. During project work-type courses, students with their supervisors carry out independent research works and apply the knowledge transferred during their studies, and provide viable answers and solutions for the business problems covered by the project works. Supervision processes are fully customized to the student-supervisor pairs, and focus on the practical utilization of students' knowledge, skills and abilities. The state-of-the-art in the literature also indicates that these types of courses are of utmost importance in the education of students by demonstrating their suitability for fulfilling the requirements set by the labour market, and by motivating their active participation in the educational processes (e.g.: Fischer and Hänze, 2019; Jääskelä et al., 2020). The Department of Management and Business Economics (MVT) of BME played a pioneer role in the development and operation of such courses at national level, as the compulsory completion of these courses is part of the curricula since the early 2000s. At this Department in the fall semester of 2017 a need emerged to develop a service quality framework that takes into account the specific characteristics of project work-type courses so that supervisors could receive feedback from students and its results can be fed back to the related

management processes for the sake of continuous improvement. This can also be interpreted as an institutional response to the performance evaluation requirements set by the HAC (2020) and ESG (2015).

In the Dissertation, the main characteristics and complicating factors of service quality measurement and evaluation in the higher education sector are presented. The differences between the operational levels of higher education institutions in terms of defining and managing service quality are also addressed. This calls attention to the fact that it is important to define the exact focus of a higher education service quality model viewed at a specific level of institutional operational hierarchy, as service quality can be analysed through different attributes at each level. Next, the features of the project work-type courses and the characteristics of the project work courses are demonstrated related to the above mentioned 4 business programs of BME. Based on the research, the final goal of the Dissertation is to develop and operate a service quality framework tailored to project work-type courses. Based on the data obtained during the development and implementation phases of the framework establishment, the specific features of project work-type courses, primarily related to the supervising process are identified that could form the basis of standardization and improvement efforts.

## **1.2. Objectives**

The framework of the research was formulated by a combination of literature research, quantitative and qualitative methods including both soft and hard analytical techniques.

The initial phase of my research focused on a thorough literature research of the service quality concept in HE context. This part was to ground the further steps of the doctoral research (see Figure 1). The literature research concentrates on the identification of stakeholders in the HE sector, the attributes of their segmentations, the separation of the levels of institutional operation and the roles of the stakeholders at each level specifically addressing the diverse roles of the students as direct customers in detail.

Following a bottom-up approach, further steps of the research focused specifically on the tactical level of institutional operation, namely the course level and within that special attention was paid to project work-type courses having specific characteristics compared to traditional courses. After identifying and presenting the features of these courses, the Dissertation details the process of the PDCA-based development and improvement of a service quality framework related to the project work supervision process at the Department of Management and Business Economics of BME. During the improvement process, not only the feedback of the voice of students and that of lecturers into the appropriate sub-processes was collected, but also determined and implemented the adjustment pro-

posals related to the methodological part of the frameworks following the organizational self-assessment logic. The research process was ended by the formation, definition and characterization of the groups of students and supervisors with different attitudes in the case of project work-type courses.

The research questions address three main issues. The first group of questions involve the second and third groups of questions as a basement; the focus is on the specific characteristics of higher education services and the measurability and evaluability of service quality in the HE sector. The second group of questions concentrate on project work-type courses emphasizing their relevance and importance in the curricula of the relevant programs as well as their specific features that form the basis for the establishment of the framework for measuring and evaluating the service quality of the supervision process. The third group of research questions focuses on the results of surveying based upon which supervised students and their supervisors were segmented on the basis of student grades, and supervisor and student characteristics.

Answering the research questions required the combined use of quantitative and qualitative techniques (for the main characteristics of the techniques, see Appendix 12.1.), therefore, an MMR research (“mixed methods research”) was applied to increase the width and depth of the collected data. The combined application of the methods provided an opportunity to deepen the knowledge about the data and their validity and to strengthen and extend the conclusion of the research (Shoonenboom and Johnson, 2017; Greene et al., 1989, 259; Bryman, 2006, 106).

The theoretical basis of the research is provided by the exploration of the background literature focusing on HE, the operational levels of HEIs, the measurability of service quality and project work-type courses. Considering the features revealed by the literature review, the service quality framework specifically for project work-type courses was developed standing in the focus of my doctoral research.

Due to the increasing socio-economic role of HE, the related literature approaches the issue of service quality management in a rather extensive and diverse way.

The literature research focuses on the characteristics of HE as a service, its measurability, and the related system of tools. The primary aim of the literature review was to explore that not only the general characteristics of services and the relatively large number of stakeholders with various parallel roles (Berényi and Deutsch, 2018b) make it difficult to define, measure and evaluate quality and specifically service quality in HE context, but also the different groups of primary stakeholders experience and interpret quality differently and in various ways at each operational level. Consequently, different characteristics dominate in determining service quality at each operational level, and thus measurability raises diverse methodological issues at the levels.

Research Question 1: *How could service quality at the different hierarchical operational levels of higher education institutions be characterized and measured?*

After examining the general service quality aspects of higher education, the research was narrowed to course level, especially to the specific characteristics and importance of project work-type courses and to the management of these courses related to the practice followed at BME MVT. Considering these characteristics, a questionnaire was developed to measure the service quality of the supervision processes of project work courses, the framework of which was later improved following the PDCA logic based on the voice of the supervisors and students.

Research Question 2: *What non-traditional features do project work-type courses have? Are there any service quality gaps and, if so, where could these gaps be detected in the supervision processes? In the case of non-traditional courses such as project work courses, how can its specific features be considered in the development of an appropriate service quality framework?*

The characteristics of project works make the full standardization of the supervision process difficult, however, based on student attitudes, knowledge, skills, etc. different clusters of students can be identified, which could help to achieve a more stable level of quality. Based on the clustering of students, the evaluation of their performance, and the characteristics of their supervisors, supervisor groups can also be identified.

Research Question 3: *Can the students be segmented into well-distinguished groups in project work courses based on their attitudes and expectations? Can supervisor groups be differentiated based on the evaluation of their students' work and the groups of students?*

The Hypotheses of the doctoral research were determined along with these questions.

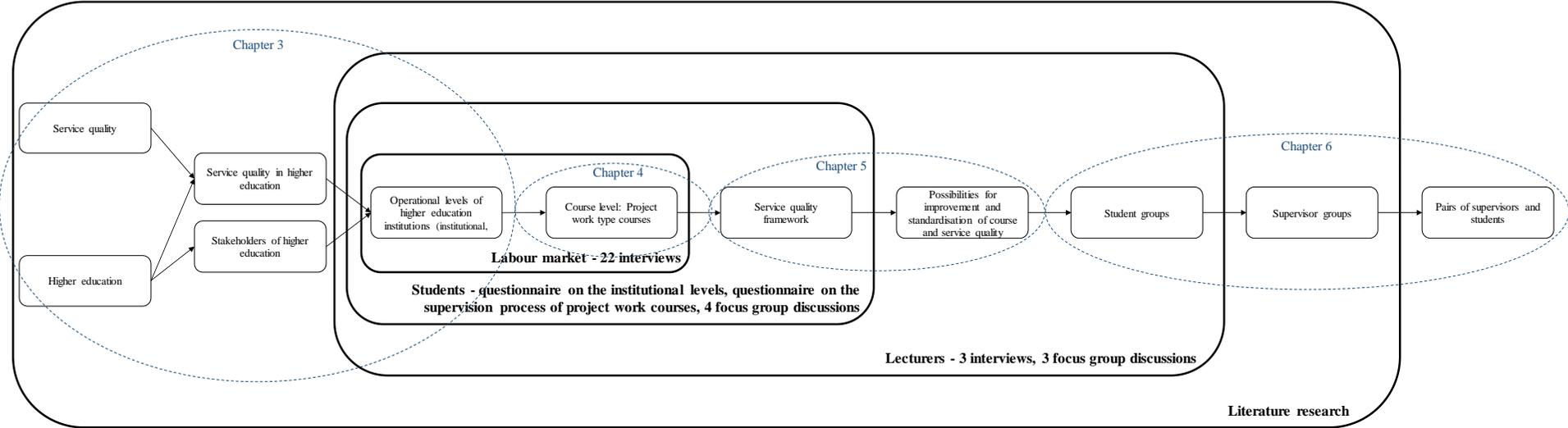


Figure 1: Main steps of the doctoral research

## 2. NEW SCIENTIFIC RESULTS

The first Thesis of the Dissertation deals with the identification and investigation of the quality related differences between the three operational levels of HEIs, that is, institutional level, program level and course level. The second, the third, the fourth and the fifth Theses focus on the course level operation of HEIs, especially on the features of a non-traditional course, namely, project work-type courses. The sixth and the seventh Theses address the possible segmentation of the primary directly interacting stakeholders, namely, that of students and supervisors of project work-type courses, highlighting the similarities and differences between the identified groups.

### 2.1. Operational levels of higher education institutions

*Hypothesis 1: Focusing on the operational levels (institution level, program level, course level) arising from the institutional hierarchy, the institutional management should focus on different aspects to measure and improve service quality at each level.*

According to the state-of-the-art, the pieces of empirical research in the field of HE quality usually addresses one of the levels of institutional operation, such as institutional level (strategic level), program level (operative level) and course level (tactic), and in most cases they concentrate on students' expectations and perceptions at all levels. However, they are not necessarily the primary stakeholders at all levels, they cannot evaluate services at every level because they simply do not experience the operation at all of them. As a result of the literatures cited in the Dissertation it could be concluded that the primary stakeholders of HEIs are the students, the academic staff and the labour market. They appear in different roles depending on the specific institutional process in focus.

Based on the literature research (see, for example, Tables 17 and 18 of the Dissertation), the applied student-focused survey and the results of the three focus group interviews, and their comparison with the original SERVQUAL dimensions, it can be concluded that each institutional level focuses on different quality attributes. The role of the academic staff is outstanding at all levels and the difference between the institutional and course levels is evident. The quality perceptions of course level primarily relate to the lecturer himself / herself. At the program level, these are covered by two attributes and supplemented by additional ones related to the curriculum and the institution. At the institution level, the course level is primarily represented by the "academic work and reputation of the lecturers", the curriculum highlighted at the program level appears in the attribute of reliability, and the additional quality attributes focus on the labour market characteristics of the institution. However, the attributes identified at the course level as the most important ones are primarily related to traditional courses. As a result of two student focus group discussions, student definitions of the characteristics identified along with each level (see Table 15 of the Dissertation) were also collected. The

main features of project work-type courses include not only the attributes identified along with the courses, but also have a strong relationship with the career opportunities defined at the program and institution levels and the attribute of labour market relations associated with the institution level.

The secondary data collection, the literature research focusing on the specific characteristics of HE services and service quality in HE context highlights the complexity of the Hypothesis in addition to the difficulties caused by the so-called HIPI principles (heterogeneity, intangibility, perishability, inseparability) characterizing services generally and the lack of a widely accepted quality definition. The results of the literature research support that the models adapted or developed for the HE sector show differences in the applied approaches (measuring and evaluating expectations-performance, importance-performance, or only performance, etc.), in their focus (institution, program, course level) and in the identified dimensions (see Table 18 of the Dissertation). Hypothesis 1 is also supported by the number of stakeholders, the differences in their roles at the distinct operational levels and the difficulty of their segmentation. The primary research, the student questionnaire, the focus group discussions, and the labour market interviews supplemented by the literature research clearly presents the differences between the quality characteristics of the different operational levels and their importance. Based on these results, three groups of quality attributes were identified related to the three examined levels of operation.

By comparing the quality attributes defined at the three levels of institutional operation with the original SERVQUAL dimensions, it can be stated that at each level the quality attributes are primarily related to the SERVQUAL dimensions of *reliability* and *assurance* (see Table 19 of the Dissertation). In the case of the program level, only one attribute is related to an original SERVQUAL dimension, that is, the *tangibles*. Based upon that part of the research the following conclusion could be drawn: the SERVQUAL model considered as an excellent basis for service quality measurement and evaluation is not able to capture quality in higher education in details, that is, the model needs to be modified according to the specifics of the HE sector and to the specific features of the applying HEI. Secondly, the comparison also demonstrates that the SERVQUAL dimensions can be applied and captured differently, through different attributes at each level.

### **Thesis 1:**

**To successfully manage service quality in higher education institutions, it is necessary to take into account that different service quality attributes dominate at the different operational level:**

- Institution level (strategic): career opportunities (during and after), scientific work and reputation of academic staff, infrastructure and equipment, reliability, institution's commitment

to improvement, institutional reputation, internationalism, industrial relationships, enrolment process;

- Program level (operative): lecturer skills and abilities, career opportunities (by the program), scientific work and reputation of academic staff, infrastructure and equipment, curriculum, internationalism, program reputation;
- Course level (tactical): lecturer skills and abilities, infrastructure and equipment, reliability, understandability (syllabus and lecture), lecturer's commitment to improvement, usefulness and utilizable knowledge, ability to arise interest, theory-practice ratio, novelty and modernity (value-added received during the course).

Related publications: **9, 10, 12, 13, 15, 16, 18**

## **2.2. Specific features of project work-type courses**

*Hypothesis 2: Due to the differences between project work-type and traditional higher education courses, the measurement of service quality related to project work-type courses must be partially different from that of frameworks developed for traditional courses.*

By following the HAC self-assessment guideline (2020), HEIs must declare during the accreditation process how they develop and provide students with practical opportunities (1.2/6), and how they can present evidence-based examples of the improvement of tools and methods related to students' knowledge and competence evaluation (1.2/10). One possible way to transfer practical knowledge is to develop and run various project work and case study courses and implement them in the curricula of the programs.

At the time of conducting my research, the primary goal of the project works in the curricula of the business programs under investigation is to provide students with professional support to be able to actively participate in solving real-life business problems at the end of their studies, to be able to develop complex solutions utilizing the already acquired theoretical and practical knowledge. In this way, students who complete these courses can demonstrate their suitability for the labour market and their ability to be able to apply the knowledge gained during their education to solve a real business problem. The result of the semester-long student work is a written paper supplemented by a mid-semester or end-of-semester oral presentation during which students summarize their semester long work, the applied methodology and the already achieved results. There are no weekly contact hours, students attend introductory lectures at the beginning of the semester when they are informed about the expectations, requirements, the student and supervision processes and the supporting administrative processes. Then, students continue to work with their supervisors assigned to their topic and they receive individual, personalized attention throughout the semester from the supervisors. In this respect, project works have similar characteristics to thesis courses.

By completing these courses, students reach the top of their university studies, incorporating the knowledge transferred during their HE studies by gaining entry to the professional community (Ashwin et al., 2017, p. 517) as student outcomes should reflect the acquired skills and abilities, attitudes, and readiness to work independently and be able to take responsibility. So, the successful completion of these courses is a kind of measure of student suitability for the labour market.

In the case of project work-type courses, most of the existing and widely used course evaluation methods encounter difficulties based on the literature research and on my experience for the following reasons:

- Heterogeneity - Lecturers from different fields supervise hundreds of students with different expectations and needs.
- Perishability - Supervision processes cannot be stored, can be utilized only there and then.
- Inseparability - The supervision process and the output depend on the cooperation and collaboration of students and supervisors (Berényi and Deutsch, 2018b). Some of the evaluation difficulties caused by inseparability can be eliminated by adequately pairing supervisors and students based upon the proper segmentation of supervisors and students.
- Intangibility - There are elements of the supervision process that make tangibility interpretable; i.e. the higher education environment where consultations and student presentations take place, the written requirements of project works, the IT system supporting these courses etc.
- The frequency and length of consultations (in person or by e-mail / telephone) are unique for the supervisor-student pairs which may hinder standardization efforts.
- The primary challenge in developing such methods is that, unlike the management of mass education courses which serve many students in parallel, these courses require the involvement of all students in the completion of project works and all supervisors in the monitoring, measurement and evaluation of student performance. (Wengrowicz et al., 2017).
- The role of supervisors is crucial in this process as the characteristics of the supervision process affect the set of outcomes used to characterize service quality at the course, faculty and institution levels (de Kleijn et al., 2014; Ashwin et al., 2017), e.g. due to the high ECTLs, the place of these courses in the curricula (last semesters of studies) and the fact that it is based on the application of the already transferred knowledge.
- There is a strong association among the process, the style of the supervision, the student-supervisor relationship, the supervision skills and abilities, and the student progress and outcome (Nulty et al., 2009), therefore, it would be prosperous to assign to every student the supervisor that best matches the needs and abilities of the student.

- The supervision of a project work is not a static but a dynamic process, so the supervisor must be present in several roles during the process (Nulty et al., 2009, p. 697).
- The characteristics of the supervision could change from semester to semester, even in the case of the supervision of a single student, as the student's improvement from semester to semester could also affect the related characteristics (Nulty et al., 2009), and the tasks and expectations may change associated with the supervision of project works as moving forward to the next level of project work.
- Naturally, there are differences between students so what works with one may not work with others.
- Supervisors should be able to distinguish among the student-customized and semester-by-semester changing service characteristics of the supervision process, and understand the changing requirements.
- Labour market participants and future project work students are unfamiliar with project work courses.

By completing these courses, students develop a range of skills and abilities that will help them find and take a job. The institution ranking of future students may also be influenced by the presence of these practice-oriented courses in the curricula. If students know that such practice-oriented and customized courses are also part of the curricula at the given institution that could be a decisive factor in the choice-making between HEIs. Due to the importance and complexity of the project work courses, the need for an appropriate service quality evaluation framework arises in connection with the supervision process.

Only the second half of the Student Evaluation of Education (SEE) questionnaire at BME can be interpreted in the case of project work courses. The questions in the traditional end of semester evaluation associated with lecturers and student performance evaluation are not sufficient to measure the service quality attributes of the supervision process (see Table 23 and 25 of the Dissertation). Through the SEE, the willingness and attitude of the supervisors that primarily determine the service quality perceptions of students cannot be measured directly, however, they are important parts of the supervision process (mentor).

The goals and characteristics of project work courses differ significantly from that of the lectures and seminars of traditional mass education courses. The participants of the two student focus group discussions, the representatives of the 5 recruitment organizations and 17 companies at the HVG job fair agreed on that student skills and abilities could be significantly improved by these courses and their fulfilment may be considered as a competitive edge during the recruitment and selection process (see Figure 17 of the Dissertation). Due to the service encounter characteristics of project work-type

courses, their fulfilment at an organization can provide an excellent opportunity to strengthen the relationship between the university and the labour market participants viewing students as the output of HE services.

The university SEE system was developed by focusing on traditional courses characterized as “theatre-like” courses, thereby it is not able to measure the perceived performance of students due to the particular characteristics of project work-type courses (see Tables 23 and 25 of the Dissertation).

### **Thesis 2:**

**The evaluation frameworks developed for traditional courses cannot be implemented in the case of project work-type courses for measuring the service quality attributes and their usefulness for students since the structure, the goal-methodology system and the operation of project work-type courses differ from the ones of traditional courses.** The main differences lie in

- the broadness and the scope of the course objectives,
- the relationship with training and outcome requirements,
- the number of contact hours per week,
- the role of lecturers and the characteristics of their relationship with students,
- the nature and size of the curriculum,
- the course management process,
- the degree of interactivity,
- the form of student performance evaluation,
- the level of practice orientation,
- the importance associated with the labour market requirements,
- and the importance of quality attributes associated with traditional courses.

Related publications: **1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 16**

### **2.3. The relationship of the quality dimensions of project work-type courses and that of SERVQUAL model**

*Hypothesis 3: Compared with the original SERVQUAL model, a different dimensional structure could be identified based on the importance evaluations related to the quality attributes of the supervising process in the case of project work-type courses due to the special service characteristics of higher education and to the specific features of project work-type courses.*

Based on the results of the improved questionnaire related to the aspects of students and lecturers and of the principal component analysis of the importance evaluations given by students collected

along with each quality attribute, it was examined how the established statement system can be compared to the original 5 dimensions of the SERVQUAL service quality model (see Table 39 of the Dissertation). Based on student importance evaluations, two dimensions can be distinguished: Relationship & Help and Feedback & Time. The Relationship & Help dimension includes the supervisor's attitude, the provided help towards students and the professional expertise of the supervisor. The Feedback & Time component focuses on the supervisor's availability, the responsiveness and the quality of feedback. While Relationship & Help is primarily related to empathy, the Feedback & Time is associated with the responsiveness dimension from the original SERVQUAL dimensions. This is partly supported by the Cramer V values listed in Table 35 of the Dissertation, which represent the strengths of association between the performance evaluations related to each aspect of the questionnaire and the overall performance evaluation result.

### **Thesis 3:**

**Interpreting student importance evaluations as student expectations, the quality attributes of project work-type courses are dominated by the characteristics resulting from the supervisor-student interaction. Based on the importance evaluations, a two-dimensional service quality structure can be identified, namely, 'Relationship & Help' and 'Feedback & Time'.**

Related publication: 17

## **2.4. Importance and performance evaluations related to project work-type courses**

*Hypothesis 4: When evaluating the service quality attributes of project work-type courses, differences can be identified in given features and segments between the importance evaluations considered as student expectations and the performance evaluations interpreted as student perceptions.*

To examine the Hypothesis in more detail, the following sub-hypotheses were formulated:

H4a: There are significant differences between the levels of education in the importance and performance evaluations of the project work supervision process.

H4b: There are significant differences between programs in the importance and performance evaluations of the project work supervision process.

H4c: There are significant differences between the management fields represented by the lecturers of the various sub-departments in the importance and performance evaluations of the project work supervision process.

The service quality framework related to the project work-type courses was developed and further improved along with the implementation of the PDCA approach. Related to the questionnaire of the developed framework, more than 1,500 student evaluations were collected by the time the Doctoral Dissertation was written. As a result of the student evaluations and student and supervisor focus group

interviews, the differences and their direction of the related levels of importance and performance as well as that of the importance and performance evaluations according to each segmentation can be identified in the case of both the pilot and the improved questionnaire.

The results of the nonparametric tests, the importance-performance map, the performance-importance diagram and the diagram displaying the summarized importance and performance evaluations confirm the existence of significant gaps between the importance and performance levels (see, for example, Figures 19-30 and Table 28, 34-37 of the Dissertation).

In the evaluation of the service quality attributes of BME MVT project work supervision process, significant differences could be identified between the importance evaluations considered as student expectations and the performance evaluations interpreted as student perceptions in the following aspects:

- regarding the levels of education (bachelor and master) - presentation, supervisor personality, a supervisor skills and knowledge, partnership;
- regarding the programs (international business administration, management and business administration, engineering management and marketing) - student interest, cooperation;
- regarding the sub-departments (Marketing Management, Management, Quality Management and Business Statistics, Production Management) - understandable feedback, availability, deadlines, willingness, response time, presentation, supervisor personality.

#### **Thesis 4:**

**When measuring the service quality in the case of project work-type courses, there are significant differences in terms of importance and performance evaluations. Significant differences are mainly related to the ‘Relationship & help’ dimension in the case of the programs and the level of study, and to both the ‘Relationship and help’ and ‘Feedback and time’ dimensions in the case of the department’s sub-groups.**

Related publications: 2, 3, 5, 7, 8, 9, 10, 11, 12

### **2.5. Differences between the teaching and supervision excellence**

*Hypothesis 5: The academic skills and abilities necessary for lecturing traditional courses are partly different from those required for the successful supervision in project work-type courses.*

The examination of the relationship between SEE and project work evaluations was aimed at investigating whether any correlation could be identified between the two groups. The comparison of the 6-semester-long student evaluation averages of the supervisors in project work-type courses and that of the SEE evaluations is shown in Figures 32 and 33 of the Dissertation. The former works with a 7-point, the SEE with a 6-point scale, so they were brought to a common base on a 0-1 scale.

Although the diagrams examining the lecturers and the sub-groups show similarities between the two types of evaluation, a general conclusion cannot be drawn from the figures alone. To examine the existence of a significant difference between the evaluations related to the SEE and the project works, Figure 32 of the Dissertation shows the quartiles for each supervisor. In several cases there is more than one quartile difference could be detected between the two evaluations supporting the existence of a significant difference. Spearman rank correlation analysis shows that there is no correlation between them which supports the Hypothesis that the fact that a lecturer has good lecturing skills does not consequently mean that he or she will also be a good supervisor (Table 42 of the Dissertation). This means that students do not expect the same skills, and abilities from a lecturer when giving lectures and when supervising.

#### **Thesis 5:**

**Teacher excellence related to traditional courses does not imply supervisor excellence associated with project work-type courses.**

Related publications: **8, 9, 10, 12, 13, 14, 16, 17**

### **2.6. Student clusters related to project work-type courses**

*Hypothesis 6: The students of project work-type courses can be categorized into different groups based on their attitudes and expectations and that affects the students' successful course accomplishment.*

During the qualitative research, the participating supervisors mentioned several times that students could be classified into different groups based on their main characteristics and attitudes towards project works. Students belonging to Group 1 only need confirmation and feedback from the supervisor, since they are considered to be able to work individually and thus they could be treated as real partners in the process (they are called Independents). Members of Group 2 are students who do not really care about the successful completion of their project work (called as Neglecters). The Group 3 can be further divided into two subgroups, namely "3a" and "3b". Students in Group 3a often need help in each and every detail (titled as Helpless), and the students in Group 3b require the continuous availability of the supervisor with their constant, active presence (called as Overanxious). Both subcategories require intensive care and a significant amount of time from the supervisor. Identifying these groups and clustering students into the aforementioned groups could facilitate the work of supervisors, as they can manage their "supervisor tools" more efficiently and effectively by classifying students into appropriate groups based on their professional experience and first consultations, and then supervising them on the consideration of group characteristics. For the data collection related to Hypothesis 6, the results of the pilot and improved questionnaire were utilized for the evaluation of the supervisors, and the supervisors of the Department of Management and Business Economics

of BME were invited to classify their project work students into the student groups mentioned above from the fall semester of 2017 to the spring semester of 2019. The analyses performed on the collected data prove the existence of the different student groups (see Figures 35-39 and Tables 43-48 of the Dissertation).

**Thesis 6:**

**Students completing the project work-type courses could be classified into the groups of Neglecters, Independents, Helpless and Overanxious and that affects the student success. The clustering is determined by the students' attitude towards the course judged by the supervisors, and based upon the importance evaluation of the service quality aspects related to the course and the received grades for their works.**

Related publications: **9, 10, 12, 17**

**2.7. Supervisor groups related to project work-type courses**

*Hypothesis 7: Supervisors in project work-type courses could be classified into different groups based on the classification of their students, the assessment of student project works and on the student evaluations of the supervisors.*

To examine the existence of supervisor groups, analyses based on the criteria including gender, professional experience, age of the supervisors, categorization of their students, and marks given to the students were performed. The results prove that to achieve the highest possible level of service quality, it is crucial which supervisor supervises which student. This does not mean that the wrong supervisor-student pair cannot perform the project work well, but for the most optimal investment of efforts, the satisfaction of students and supervisors the proper pairing may be crucial. The results of the nonparametric tests show that there are significant differences between the student groups in the distribution of marks related to each group of supervisors (see e.g. Table 56 of the Dissertation). To prove the Hypothesis, the information collected through the student and supervisor questionnaire (see Table 59 of the Dissertation) was utilized.

**Thesis 7:**

**The supervisors of students of project work-type courses could be classified into the groups of Just do sg, Kind-hearted, Aim-oriented, Independents preferred which affect the student success. The clustering of the supervisors is determined by the classification of their students, the length of their professional experience related to the courses, the grades given to students and the evaluations of the aspects in the service quality framework associated with the courses.**

Related publication: **17**

### **3. RESULTS, LIMITATIONS, CONCLUSIONS**

#### **3.1. New and novel results**

Based on the literature review and the primary research results, the new and novel scientific results of my Dissertation could be summarized in three points.

1. In the literature and related primary research, the studies and empirical results focusing on the stakeholders of higher education, the operational levels of higher education institutions and the measurement and evaluation of the service quality of the sector are reviewed:

- defining quality in HE is a complex task due to the higher number and specific characteristics of stakeholders, their various expectations of and their parallel roles in higher education, the differences in the quality focus of each operational level and the service quality characteristics of the HE sector;
- HE service quality models in the literature investigate the level of service quality along partly different dimensions and focus primarily on students' perspectives;
- different groups of quality attributes can be assigned to each level of operation of HEIs, and it is worth measuring the service quality by focusing primarily on these.

2. Project work-type courses have different characteristics from traditional courses based on the literature and related primary research results connected to the quality of this type of course:

- project work-type and traditional higher education courses differ in the following characteristics: the broadness and the scope of the course objectives, the relationship with training and outcome requirements, the number of contact hours per week, the role of lecturers and the characteristics of their relationship with students, the nature and size of the curriculum, the course management process, the degree of interactivity, the form of student performance evaluation, the level of practice orientation, the importance associated with the labour market requirements, and the importance of quality attributes associated with traditional courses;
- there are significant differences between the importance and supervisor performance evaluations given by students related to certain aspects of the project work-type courses;
- based on student importance evaluations related to quality attributes of the supervision of project work-type courses, the quality attributes can be classified into two dimensions ('Relationship & Help' and 'Feedback & Time') and focus primarily on the SERVQUAL dimensions of empathy and responsiveness;
- the abilities and skills required to achieve the supervision excellence associated with this type of course and the lecturer excellence associated with traditional courses do not fully match,

that is, the fact that a lecturer is highly rated in the SEE does not necessarily mean that he or she performs well as a supervisor.

- the PDCA logic provides the basis for the development and further improvement of the service quality framework related to project work-type courses in terms of both capabilities and results achieved.

3. The data collected in the service quality framework developed for the project work-type courses, the characteristics and results of the students, and the characteristics of the supervisors are presented based on which the following conclusions can be made:

- the students of these courses can be classified into different groups based on their attitudes and expectations towards the project works;
- the supervisors of the students of these courses can be classified into different groups based on their related characteristics.

### **3.2. Conclusions and recommendations**

Managing the increasingly competitive situation in the HE sector requires HEIs to pay more attention to the identification and weighting of the attributes of service quality, to measuring and evaluating the level of service quality achieved, and to its continuous improvement. However, service quality can be interpreted differently at the various levels of institutional operation, with different quality attributes coming to the forefront at the different levels.

The research results of HE service quality available in the relevant literature have been extensively reviewed based on which it could be stated that the definition and the specific attributes of service quality differ from one institutional operational level to another. This was also supported by the results of the primary research conducted with the involvement of both students and lecturers.

One of the consequences of the mass feature of higher education service provision is that the standardization of educational processes cannot take into consideration to individual needs and expectations, the phenomenon of mass education does not favour the broader appearance of practice-oriented tasks in student studies as they require individual attention to which mass education is not responsive. Project work-type courses provide a viable answer to this challenge as they develop students' cooperative skills and promotes the view of system approach. During these courses students face time management and prioritization issues as well as the practical application of their theoretical knowledge, the need for continuous improvement, and the improvement of communication skills are also required. These are the skills and abilities that enable a graduate to successfully enter the labour market. This fosters students becoming active participants rather than passive recipients in the educational processes. In terms of teaching methods, the emphasis is increasingly shifting towards a

project and process approach, from teaching to learning. For this reason, institutions must continue to monitor the perception of service quality associated with this type of courses. One of the most important results of the Dissertation is the development and improvement of the service quality framework that meets these challenges.

By grouping the students and supervisors of the project work-type courses, the so-called uncertainty arising from the HIPI characteristics, and the pairing of the appropriate groups of students and supervisors could help to increase the standardization of the supervision process, resulting in a more successful improvement of student skills and competences.

### **3.3. Practical application of the research results**

The practical applicability of the research could be summarized in 6 points:

- The quality evaluation of the HEI operation and their ranking according to quality attribute groups can be basically standardized. These groups of attributes allow a general comparison of Hungarian HEIs, programs and courses from both a student and a lecturer perspective.
- Identifying the specific characteristics of project work-type courses could serve as an input for developing appropriate institutional strategies or action plans, or for breaking down strategic goals.
- Identifying importance-performance gaps associated with project work-type courses can underpin the purpose and direction of improvement strategies focusing on supervisor performance, highlighting differences between programs, levels of education and areas of management.
- The PDCA logic based development and improvement of the service quality framework for project work-type courses could facilitate the development of other frameworks for similar purposes.
- Highlighting the difference between supervising and teaching excellence supports the need for a different service quality framework, further reinforces significant differences between traditional and project work-type courses, and the results may be considered as the first step in differentiating between skills and competencies related to lecturers and supervisors.
- Grouping and pairing students and supervisors of project work-type courses could help to adjust to service quality inequalities and increase student satisfaction and individualisation.

### **3.4. Limitations of the doctoral research**

The results of the doctoral research could be generalized by considering four main limitations:

- The groups of quality attributes defined related to the institutional levels were formed primarily based on the data collected at BME, however, these results were later supported by a questionnaire based data collection extended to students of other universities. Based on Spearman rank correlation analysis of the first and second questionnaires' results, they display strong correlation, although the number of respondents of the universities show high variability. Since the results of the second questionnaire support the results of the first questionnaire, which were supplemented later with the results of focus group and personal interviews, it may be stated that the three attribute groups are not BME specific. (Thesis 1)
- In Thesis 4 stated in relation to project work-type courses, the importance and performance gaps and dimensions on the basis of the feedback from the students of the project work course of four BME programs were formulated. Thus, the results are mainly related to BME-MVT, but due to the TOR (Training and Output Requirements) and what is written in the publicly available sample curricula, their generalizability can be assumed in the case of the same programs of other Hungarian universities.
- Theses 2, 3 and 5 are also largely based on the BME-MVT experience and the first results of the developed framework, however, their validity is presumably sufficiently supported by the literature. In the statistical analyses, mainly non-parametric tests were run with which small differences are not easy to detect and manage.
- Theses 6 and 7 are built on the results of various data collections related to BME, however, I believe that the large number of information collected and the presumed similarity of project work-type courses related to different Hungarian universities are sufficient to generalize the results.

It is also worth emphasizing here that the economic and financial background of the education based on project work-type courses are not part of the Doctoral Dissertation.

### **3.5. Future research plans**

The future research plans can be outlined as follows:

- In connection with the determination of the importance weight of the groups of quality attributes defined for each level of HEIs' operation, a new questionnaire could be developed which could have three target groups including institutional management, lecturers and students. Based on this, the importance-based examination of the gaps identified by the Gap model may be feasible. Once the importance weights have been determined, it will be possible to collect and process institution-, program- and course-specific performance evaluations related to each quality attribute.

- The adaptation of the educational process to individual needs, which is challenging due to the current mass education conditions, can be facilitated by increasing the number of project work-type courses in the curriculum in HE programs. However, neither the labour market nor potential students are familiar with these courses, so promoting them could provide an unexploited competitive advantage for institutions.
- Promoting the framework of project work-type courses at BME GTK and other institutions where this type of course exists would support the widespread validation and reliability testing of the service quality framework. One of the next steps of research continuation could be the application of the framework in other departments and institutions.
- Gathering the opinions of graduates who have completed the project works would support the promotion efforts associated with the course. Involving graduates in the further improvement of the service quality framework as labour market expectations could also be considered as an exploitable opportunity.
- The established framework could be further developed by utilizing the AHP (Analytic Hierarchy Process) method, which could make it easier to identify minor discrepancies.
- Further examination of the student and supervisor groups requires the completion of the service quality questionnaire related to the project works by students in connection with which it is possible to identify which student group the evaluating student belongs to. Based on these results, the formation of student-supervisor pairs could be underlined. In the next semesters, based upon the clustering of students, the evaluations of the four groups of students collected with the service quality framework could be differentiated and I might start the pairing of students and supervisors based on the new analyses.

#### 4. SUMMARY

In my Dissertation, service quality, its nature in HE context, and the stakeholders of HEIs are thoroughly investigated. Primary research focused mainly on the operational levels of higher education institutions and the measurability of service quality related to project work-type courses, taking into account the perspectives of students, lecturers and the labour market, namely the primary stakeholders.

The components of service quality vary by service sectors, however, regardless of the sector under investigation, most of the proposed service quality models are based on the SERVQUAL model developed by Parasuraman et al. (1985, 1988) focusing on the general characteristics of the services. The service quality measurement and evaluation efforts of the higher education sector also follow the methodology of SERVQUAL- and SERVPERF-based models, the latter was developed along with the former's critique. The dimensions and characteristics of service quality models adapted to HE or developed directly for this sector are very diverse. However, basic quality attribute groups can be identified in connection with each level of institutional operation. The differences in quality between the institution, program and course levels are supported by both the literature research and analysis, and the results of the conducted primary research.

The focus of the Doctoral Dissertation is a special type of HE course, namely, the project work-type courses. By completing these courses, students' skills and abilities improve, their fulfilment is an advantage during searching and applying for jobs and they also make it possible to customize the educational process to students as individuals.

Project work-type courses have different characteristics compared to traditional courses, so the traditional Student Evaluation of Education questionnaire is not able to measure properly the attributes of the supervisor performance to such a depth that the results could be used to improve supervisor performance.

There are significant differences in the importance of service quality aspects and the related supervisor performance of project work-type courses, as well as in the related importance and performance evaluations, by levels of education, programs and management areas, and also between performance evaluations collected in the SEE system and in the developed evaluation framework. These indicate that the rules of mass education do not work for this course, individual needs should be taken into account in the supervision process as students at different levels of education, programs and areas of management have different expectations. Student needs are proved to be primarily related to supervisor empathy and responsiveness.

The presented service quality framework improved upon the PDCA approach allows the measurement and comparison of the importance scores and the related supervisor performance evaluations

through 15 quality characteristics. Based upon that student satisfaction can be examined even weighted by the importance evaluations of the individual aspects, and the size and direction of the importance-performance gaps can be analysed along with the different segmentation criteria. During the development of the applied questionnaire, the perspectives and comments of both the project work students, the project work supervisors and the potential project work students were used.

Students and supervisors of project work-type courses can be classified into different groups based on student attitudes, expectations, grades, and supervisor characteristics. Based on the primary research and the analyses performed on the collected data, significant differences can be discovered between the characteristics of both the student and supervisor groups. By further examining these groups, the continuous change in the level of related service quality can be reduced, and the creation of student-supervisor pairs based on group characteristics would allow the more effective use of resources and result in a higher level of satisfaction of both stakeholders.

Project work-type courses are a central part of the curricula of the higher education programs involved in the research, so it is essential to monitor the level of service quality continuously by the institution. My Doctoral Dissertation proposes a possible answer to this challenge by the developed service quality framework.

My scientific research has the potential to continue with data collection and analysis. To further examine the levels of institutional operation, the launch of a new, improved questionnaire and the start a new phase of data collection could be considered. Concerning the service quality framework, the aim is to extend data collection to more departments and institutions. By further exploring the opportunities lying in student-supervisor groups, I intend to aim the formation of appropriate student-supervisor pairs.

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## **6. OWN PUBLICATIONS**

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