

ASSESSMENT OF STUDY PROGRAMME QUALITY AT HIGHER EDUCATION INSTITUTION

Sandra Sproge, Rudite Cevere
Latvia University of Agriculture
sandra.sproge@llu.lv, rudite.cevere@llu.lv

Abstract. A study programme in a higher education institution is a product, which is offered on the education market. Therefore, the institution shall assure, evaluate, and improve the quality of its study programmes. The previous research and studies show that the best practice of software engineering may be applied for the evaluation of study programme quality. This analogy is possible as both software and study programmes are abstract products that cannot be physically weighted, measured, or visually evaluated in any other way. Quality evaluation requires another approach. Transformation of software product quality model on the sphere of education provides methods for the evaluation of the study programme quality. The paper is aimed to demonstrate how a higher education institution through the involvement of students may evaluate the internal and external quality of a study programme. In 2009, the Faculty of Information Technologies started the approbation of the methodology and in the autumn term of 2011 it was introduced for the quality evaluation of all study programmes at the Latvia University of Agriculture. The obtained results allow concluding that the chosen methodology ensures significant information for the quality improvement of each individual study course and simultaneously of the whole study programme.

Keywords: internal and external quality, study programme, quality model, quality metrics.

Introduction

The quality of a study programme is an essential indicator of the study process at a higher education institution, the state education system, and the common European Higher Education Area. The learning outcomes provided by a qualitative study programme may ensure a successful inclusion of the new specialists into the labour market, opportunities for further studies, and research activities [1]. Accreditation is a state guarantee for the quality of the study programme. Accreditation is an external assessment of a study programme, which evaluates the quality in compliance with the following criteria [2]: the aim and tasks of the study programme; content and organisation of the study programme; presentation and knowledge evaluation; assurance and control of the studies; research work of the staff and the students; quality assurance and warranty.

Accreditation of the study programme is a type of quality evaluation where an external accreditation commission determines whether the study programme complies with the previously set minimum quality standards [3]. The main difference between accreditation and quality assessment is that accreditation determines whether the study programme complies with the previously set minimum quality standards, while quality assessment determines the academic quality level [4]. Higher education institutions themselves shall evaluate the quality on regular basis. Generally, the external quality evaluation of a study programme is based on self-assessment reports prepared by higher education institutions (HEI). In Latvia, HEIs prepare self-assessment reports for every study programme every study year. The Cabinet of Ministers Regulations of the Republic of Latvia envisage including of the surveys of students on the quality of study programmes in the self-assessment reports. Such surveys should be organized every study year and not only once in a period of accreditation to ensure that the students are really involved in the quality evaluation and improvement of the study programme. The issues like evaluation of the quality, setting of quality criteria, and measuring of quality criteria become essential aspects. Certainly, not only the process of evaluation is significant but also its target and the way the data obtained are to be used for further quality assurance and improvement. Setting of the quality criteria is not unequivocal, since many stakeholders – management of the HEI, directors of study programmes, students, potential employers etc. are interested in the quality of the study programme. Therefore, the quality criteria should be understandable for every stakeholder. The authors in their research offer applying a quality model, which is developed based on the software quality model for the quality evaluation of a study programme [5]. This analogue is offered, since both software and a study programme are abstract products, which either may not be physically weighted, measured, or visually evaluated in any other way. The students successively acquiring the offered content of study programme may evaluate each

study course mastered by means of certain quality characteristics. Evaluation of every study course ensures a feedback to the teaching staff member, while the summary on all evaluated courses provides the general quality evaluation of the study programme.

Materials and methods

The authors in their previous research have already offered transformation of the software quality model ISO 9126 to the sphere of education [6; 7] to assess the quality of study programmes during their development and implementation. The obtained quality model is outlined in Figure 1.

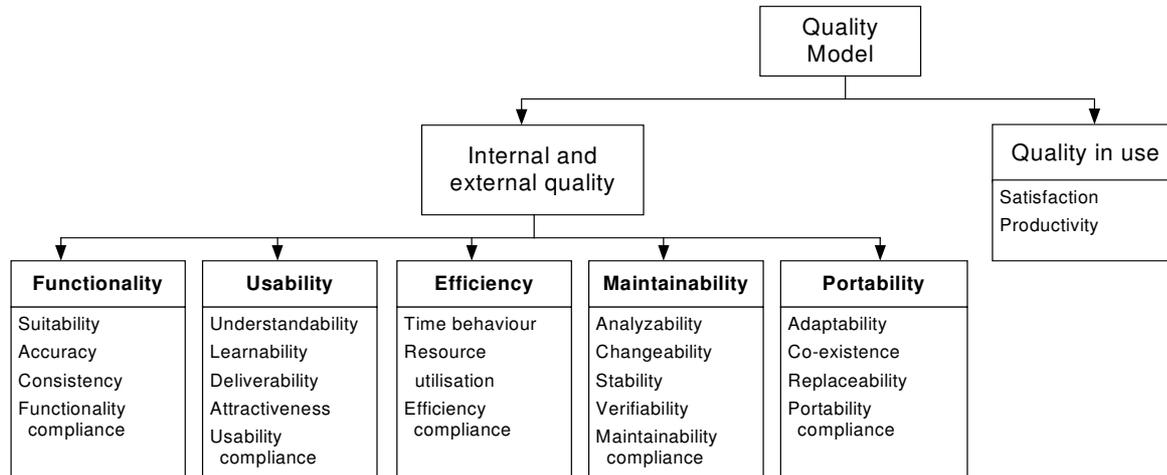


Fig. 1. Quality model of a study programme

The essence of the quality model is that the study programme is viewed as an element of the system by defining its internal and external quality. The internal quality of a study programme covers the content of the study courses included in the study programme, teaching aids, and qualification of the teaching staff; the external quality is the implementation of the study programme within the study process and the achieved learning outcomes. The quality of the study programme may be evaluated through 5 quality characteristics and 21 sub-characteristics that are related hierarchically. The quality characteristics of the model relate both with the internal and external quality of the programme. The same quality characteristics may be applied as the differences arise during measuring and the way of what type of metrics are applied. The general quality of the programme is determined by measuring its characteristics.

The following procedure should be observed when starting quality evaluation of a study programme at a higher education institution:

1. choice of a stakeholder – several stakeholders are interested in the study programme quality and each of them has its own requirements regarding the quality, for example, a student wants to study in a study programme, which is understandable, has clearly defined learning outcomes, and efficient to master, while the study programme director wants to have a study programme the development and implementation of which is easy to administer and control;
2. definition of the aim for quality evaluation – quality should not be evaluated just for the sake of evaluation; evaluation shall ensure clear definition what is to be done with the obtained results and how the feedback is ensured to the stakeholders;
3. selection of quality characteristics – characteristics and sub-characteristics shall be selected from the quality model depending on each stakeholder of a particular evaluation;
4. selection of quality metrics – appropriate metrics should be used for obtaining the data of the quality indicators and adapted to the selected quality sub-characteristics;
5. implementation of the measuring process;
6. processing and analysis of the obtained data;
7. quality improvement activities.

The internal quality of the study programme affects the external quality, while the external quality depends on the internal quality. A student, when evaluating the external quality of the study programme, prepares information for the teaching staff member and the director of study programme

on the internal quality of the study programme. Upgrading and improvement of the internal quality of the study programme simultaneously improve its external quality. In case the quality evaluation of the study programme is based on the evaluation of the study courses, then the evaluation shall be held regularly, every study year (Figure 2). The data obtained within a several-years period will allow the study programme director to develop and undertake quality improvement activities.

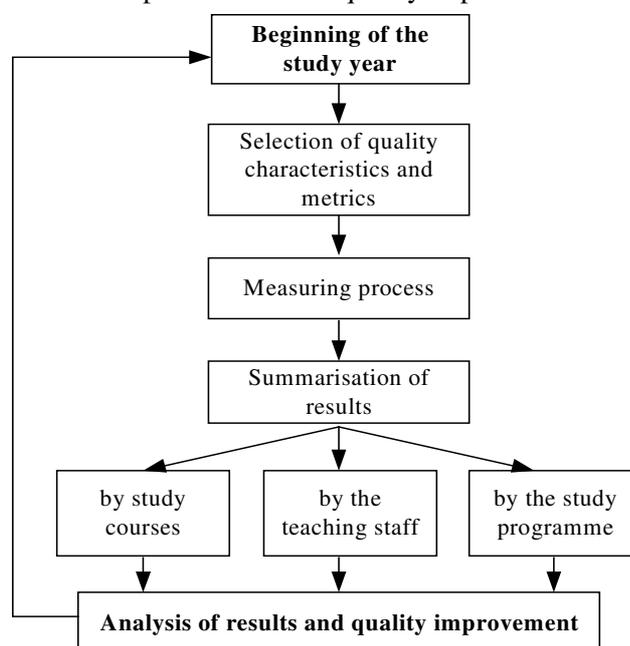


Fig. 2. Study programme evaluation process

From the study year 2009/2010, the Faculty of Information Technologies, Latvia University of Agriculture has started quality evaluation of the study programmes applying the quality model outlined in Figure 1. A survey of the students during which the students evaluated every study course mastered during the term was used for the measuring process. From the autumn term of the study year 2011/2012, such evaluation has been initiated for all study programmes at the Latvia University of Agriculture. The evaluation was done based on the 5 quality characteristics and 10 sub-characteristics selected from the quality model. Table 1 displays quality metrics for the selected characteristics.

Table 1

Quality characteristics for evaluation of a study programme

Quality characteristic/sub-characteristic	Metric
Functionality/ Suitability	Compliance of the delivered study course with the course description
Functionality/ Accuracy	Competence of a lecturer in his/her study course
Functionality/ Interoperability	Overlapping of the study course with the content of other study courses
Usability/ Understandability	Understandable explanation of themes of the study course
Usability/ Learnability	Promotion of mastering the study course through the teaching methods and approaches used by a lecturer
Usability/ Attractiveness	Oratorical skills of a lecturer
Efficiently/ Resource application	Promotion of mastering the study course through availability of study materials
Efficiently/ Resource application	Availability of a lecturer's tutorials
Efficiently/ Time behavior	Promotion of mastering the study course through test assignments
Maintainability/ Stability	Introduction of the students with the requirements for mastering the study course at the beginning of the study course
Portability/ Co-existence	Acquired useful knowledge, skills and competence

The standards [8] offer various metrics for the evaluation of software product quality characteristics in compliance with internal and external characteristics of the quality model. By analogy, the authors offer applying a common outline for definition of metrics and interpretation of values to evaluate the internal and external quality indicators of the study courses. The outline is shown in Table 2 and it is based on the description of one metric example.

Table 2

Outline for definition and interpretation of metric

Purpose of the metrics	Does the content of study course conform to the initially defined?
Method of application	Count the number of negative estimations (very low, low, average) given in the questionnaire and compare it with the total number of estimations
Formula and data element computation	$X=1-A/B$ A – number of negative estimations B – total number of estimations
Interpretation of value	$0 \leq X \leq 1$ The closer to 1.0, the better
Metric scale type	Absolute (1-very low, 2-low, 3-average, 4-high, 5-very high)
Measure type	A, B – count X – count/ count

Results and discussion

In the autumn term of the study year 2011/2012, the quality evaluation process of the study programmes of the Latvia University of Agriculture encompassed 1142 students (23% of the total number of students). The evaluation covered 485 study courses from 55 study programmes. The Information System of the University was used for quality evaluation and displaying of the obtained data. The students evaluated every study course mastered during the autumn term by means of the metrics shown in Table 1. The scale for evaluation: 1-very low, 2-low, 3-average, 4-high, 5-very high. In addition, the students had an opportunity to write freely recommendations for the improvement of each study course.

The summarized learning outcomes are available in three breakdowns:

1. *by a study course* – total data of each metric are expressed as the average value and student recommendations for the improvement of the study course are given in parallel (Figure 3).

Name of the study course (16/50=32%) (Number of students having evaluated the study course / number of students having mastered the course = %)

Average	Question
4.4	At the beginning of the study course, a lecturer introduced students with the requirements for mastering the study course
4.33	Delivery of the study course complied with the course description
4.53	Study course did not overlap with the content of other study courses
4.6	Competence of a lecturer in his/her study course
3.93	Lecturer explained themes of the study courses understandably
4.07	Oratorical skills of a lecturer
3.87	Teaching methods and approaches applied by a lecturer promoted mastering of the study course
4.64	Lecturer's tutorials were available
4.07	Study materials (course books, teaching aids, handouts etc.) were available and promoted mastering of the study course
3.67	Test assignments (test work, tests, colloquiums, reports etc.) promoted mastering of the study course
4.13	I acquired useful knowledge, skills and competence

Students' recommendations for the improvement of the study course:

More practical tasks
 More practical tasks that are evaluated with the mark
 Testing of theory could be more profound
 To prepare teaching aids in more available amount

Fig. 3. Evaluation summary of one study course

2. *by a teaching staff member* – data on quality evaluation of each study course taught are available to each teaching staff member; the data are shown by the study courses and provide total evaluation for entire study courses;
3. *by a study programme* – data on all study courses of the study programme are available to the study programme director; thus, providing a general idea on the quality of the study courses within the particular study programme.

Summarising the evaluation of each study course of the study programme by means of an outline for interpretation of the metrics given in Table 2 allows obtaining the general quality of the study programme by every selected quality characteristic and sub-characteristic (Figure 4).

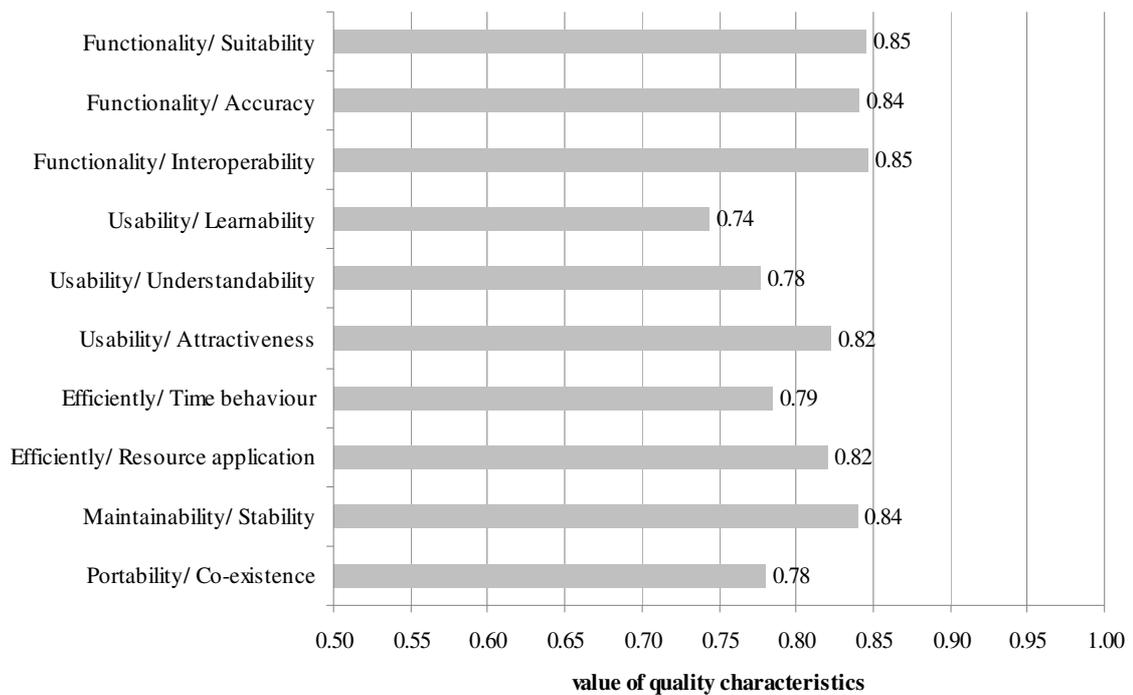


Fig. 4. Summary of quality characteristics for one study programme

Regular evaluation of the study programme quality allows analyzing the evaluation of its quality characteristics by years (Figure 5) for individual characteristics and all characteristics together. Figure 5 displays that the quality characteristics “Usability/Understandability” have increased and become stable compared with the autumn term of 2009, i.e., the initial period of evaluation.

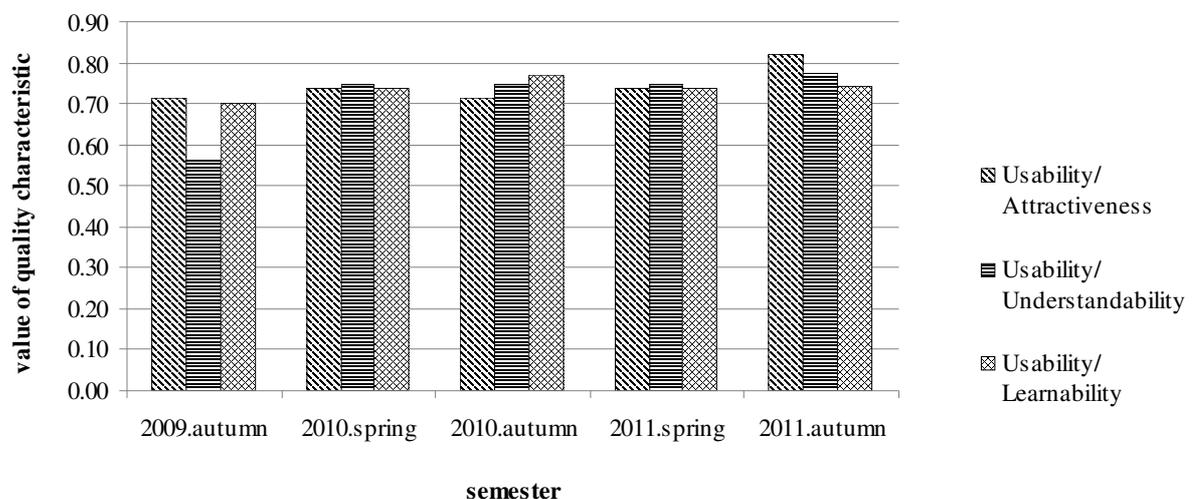


Fig. 5. Quality characteristics “Usability” for one study programme

Conclusions

1. A higher education institution itself shall ensure regular evaluation of the internal and external quality of the study programme.
2. Involvement of the students in the quality evaluation of the study programme shall be developed as a tradition of the higher education institution, thus, involving the students in quality improvement and strengthening. Evaluation of the study courses should become an integral part of the study process.
3. The data summarized as the result of evaluation should be available to:
 - students, so they may familiarize themselves with the evaluation of those study courses they are willing to master. The results are summarized by each individual study course;
 - teaching staff, so they may familiarize themselves with the evaluation of each study course taught by them and improve the quality of the study courses. The results are summarized by every teaching staff member;
 - directors of the study programmes, so they may familiarize themselves with the evaluation of each study course of their study programme and consider the evaluation when undertaking quality improvement activities of the study programme. The results are summarized by each study programme;
 - administration of the HEI, so they have the idea on the quality evaluation of all study programmes and could consider evaluations when developing the quality policy of the HEI.

References

1. Rusakova A, Rauhvargers A. (2010). Methodology for Implementing Learning Outcomes in a Study Programme as Basis for Future Recognition of Prior Learning. *Problems of Education in the 21st Century*, Vol. 26, pp. 124 – 131.
2. Procedure for Accreditation of Higher Education Institutions, Colleges and Higher Education Study Programmes, Cabinet Regulations (2006). Retrieved 11/05/2010, from: <http://www.likumi.lv/doc.php?id=145125> (Latvian).
3. Grendel T., Rosenbusch C. (2010). System Accreditation: an Innovative Approach to Assure and Develop the Quality of Study Programmes in Germany. *Higher Education Management and Policy*, Vol. 22, No. 1, pp. 87-98.
4. Skolnik M. (1989). Quality Assurance in Higher Education as a Political Process. *Higher Education Management and Policy*, Vol. 22, No. 1, pp. 67 – 86.
5. Čevere R., Sproģe S. (2010). Application of Software Quality Models in Evaluation of Study Quality. *Problems of Education in the 21st Century*, Vol. 21, pp. 37 – 48.
6. Sproģe S., Cevere R. (2011). Software Development Quality Models in Engineering Education. In: *Proceedings of the 10th International Scientific Conference Engineering for Rural Development*. Jelgava: LLU (Latvia University of Agriculture), 2011, pp. 536 – 541.
7. Cevere R., Sproģe S. (2011). Quality Life Cycle of the Study Programme and Methodology for Evaluation. In: *Proceedings of the 3rd International Conference: Institutional Strategic Quality Management - ISQM2011*, Sibiu, Romania, 2011, pp. 65 – 72.
8. ISO/IEC 9126-2:2003. Software Engineering – Product Quality – Part 2: External Metrics – International Organisation for Standardisation.