SQELT PROJECT

SUSTAINABLE QUALITY ENHANCEMENT IN HIGHER EDUCATION LEARNING AND TEACHING. Integrative Core Dataset and Performance Data Analytics

Key Action: **Cooperation for innovation and the exchange of good practices**
Action Type: **Strategic Partnerships for higher education**

Partners: evaluation Agency Baden-Wuerttemberg, UNIVERSIDADE DE AVEIRO, BIRMINGHAM CITY UNIVERSITY, UNIVERSITEIT GENT, UNIWERSYTET JAGIELLONSKI, UNIVERSITÄT FUR WEITERBILDUNG KREMS, UNIVERSITEIT LEIDEN, UNIVERSITÀ DEGLI STUDI DI MILANO, UNIVERSITETET I OSLO, Centro de Investigação de Políticas do Ensino Superior

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Intellectual Output 3:
Baseline Report on Project Partner HEIs' Performance Data Management Models

The Case of Jagiellonian University in Kraków (JU)

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List of acronyms

HEI – Higher education institution

L&T – Learning and teaching

PDRLA – Personalized data required for Learning Analytics

PI – Performance indicator

QA – Quality assurance

QEI – Quality evaluation instrument

QM – Quality management

TBDE – To be determined by evaluation

Executive summary

Introduction

This report presents the results of a study on the Performance Data Management Model conducted at the Jagiellonian University in Kraków (JU), whose aim was to verify the use of the common Learning and Teaching (L&T) indicators (using the O20 questionnaire of the SQELT project) and the scope of Learning Analytics (LA) solutions implementation. The study was conducted in the winter semester of the academic year 2018/19 between students, teachers, quality management staff and leadership members.

The O20 questionnaire consists of four main parts:

- stakeholders' assessment of core data,
- stakeholders' assessment of performance indicators,
- stakeholders' assessment of quality evaluation instruments,
- stakeholders' assessment of Learning Analytics.

Each of them was filled by respondents who additionally talked about particular items and their presence at the JU. Discussions concerned two issues, on the one hand the meaning and significance of using particular items in higher education, on the other hand, the solutions adopted at the university.

Core data, performance indicators and quality evaluation instruments

From the respondents' point of view, the distinction between these three blocks of subjects was unclear, which was clearly communicated by them. Therefore, there are reasons for jointly presenting them. Each issue contained in the survey was rated in two dimensions, presented in the form of a three-point ordinal scale. The first of them, called usefulness for the JU, allowed to answer: indispensable, useful or useless, encoded as values from 3 to 1. The second dimension, called the degree of collection of data at the JU, allowed to answer: regularly collected, occasionally collected or not collected in my HEI, also encoded as values from 3 to 1..

The report presents both average values of responses given and contingency matrices for both dimensions. The results are presented in individual chapters along

with the suggested similarities and differences between groups of respondents. However, these comparisons should be treated with a high degree of scepticism due to the high probability of non-homogeneity within groups, whose impact on the results cannot be verified with a small sample size.

Table 1: Total average usefulness and average degrees of collecting data at the JU, expressed on a scale from 1 (lowest value) to 3 (highest value).

	Average usefulness	Average degrees of collecting data
L&T Environment	2,19	1,83
Learning Competences & Processes	1,92	1,54
Teaching Competences & Processes	2,19	2,05
Learning Outcomes & Learning Gain & their Assessment	2,18	2,12

In the direct comparison of individual item categories, after excluding the differentiation by respondent group and data type, the lowest average response was obtained in Learning Competences & Processes (see Table 1). This is in line with the general conclusion that "teaching" orientation on education prevails at the JU, while the "learning" is often treated as a matter of individual differences. In each category, the usefulness was rated higher than the degrees of collecting data, which indicates the still existing need for information on the effectiveness of the educational process.

Learning Analytics

Obtaining any statements about LA at the JU caused many difficulties resulting from uncertainty about the proper meaning of the term. The definition contained in the questionnaire was helpful, but it did not dispel all doubts. Suggested LA functions, which formed the starting point for further associations, turned out to be a better aid for respondents. This problem is discussed in more detail in the chapters devoted to stakeholders' assessment of Learning Analytics.

The general conclusion, which is formulated on the basis of the collected material, is the lack of LA at the JU. However, some LA functions are implemented using a different terminology as part of the internal teaching quality system. Others are held

without top-down regulations, as part of direct relationship between the student and the teacher. It seems that further discussions on LA require a clear separation of such activities from other activities under L&T, without which it will be difficult to form unambiguous conclusions.

Sample, time schedule and data types of the baseline case study

Four groups of respondents were invited to participate in the study, with two different qualitative methods applied to them: structured interviews based on a questionnaire with HEI leadership and QM staff and focused group interviews (FGIs) with students and teachers. Five representatives of HEI leadership and five representatives of QM staff were chosen from different JU faculties, to reflect the heterogeneous structure of the university. The assumption of individual contacts with members of these two groups was expected knowledge of the procedures used in their units. With regard to teachers and students, as groups characterized by less involvement in procedural and organizational activities, it was decided to conduct group interviews, expecting mutual stimulation of discussion participants. To reduce the shyness effect, two separate FGIs were organized, one for teachers and one for students. Due to the complexity of the discussion topic, six to eight people were considered the optimal group size. The only key to selecting the sample was representing the various departments of the JU. Taking into account the expected cancellation of participation in FGIs, half more people were invited than necessary.

On the basis of the above assumptions, the following meetings were successfully conducted:

- Students – FGI was attended by four students involved in activities in the student self-government from various faculties of the JU. One additional absent student submitted a completed questionnaire. After familiarizing themselves with the purpose of the meeting, they proceeded to individually filling out the questionnaires. Subsequent thematic blocks were discussed on an ongoing basis, providing qualitative materials for analysis. The meeting lasted two hours.
- Teachers – FGI was attended by eight academic teachers from various faculties of the JU. After familiarizing themselves with the purpose of the

meeting, they proceeded to individually filling out the questionnaires. Subsequent thematic blocks were discussed on an ongoing basis, providing qualitative materials for analysis. The meeting lasted 2.5 hours.

- Quality management staff – Individual contacts were preceded by sending a questionnaire with a request to fill up to about 50 people officially involved in pro-quality activities at JU. Such a large number of invited respondents was inspired by the desire to take a closer look at the local specificity of individual university units. Unfortunately, only five people answered the request. They were asked about individual items of the questionnaire and their own reflections on Learning Analytics, with conversations lasting from a quarter to two hours.

- Leadership – This was the most difficult group of respondents with whom the expected number of individual meetings was not carried out. Therefore, it is intended to present their opinions in a later addendum to this report.

As can be seen below, the applied questionnaires and key questions can be used to generate nominal and ordinal data, but not genuinely metric data. Methodologically, for nominal data only information about frequencies and shares can justifiably be extracted from the data. In addition, ordinal data have a 'natural' order and mathematical comparison operations such as 'larger than' are properly defined. Only with genuinely metric characteristics, however, all arithmetic operations can be carried out in a meaningful way, for example calculating average values, correlations or regressions. Metric data are therefore also the basis for the application of the 'normal distribution' (Gaussian distribution).

However, often pseudo-metric scaling is applied to ordinal data, i.e. numerical values are 'arbitrarily' assigned to the (discrete) ordinal scale, which results in a 'rating scale'. Then, some metric methodologies like those mentioned above can be applied, though with restricted methodological justification, i.e. results are to be interpreted with caution (specifically when the sample sizes are small).

Particularly, computations of averages, standard deviations, and the normal distribution are now also possible, although it is not a metric scale. For example, such averages are therefore not 'real' averages, since no measured values are defined on a pseudo-metric scale between the discrete defined measured values; nevertheless such averages etc. can still be informative in descriptive statistics.

Against that backdrop, in this case study nominal, ordinal and pseudo-metric ordinal data are used, since metric data are not available.

Stakeholders' assessment of core data

Structured survey about core data

The approached stakeholders were asked to answer individually or discuss in focus groups certain issues and fill in a questionnaire (Table 1a), which is about university data that can be collected for quality monitoring and improvement in learning and teaching (L&T). For example, such data may be included in mandatory or non-obligatory quality reporting requirements, target agreements, rankings, etc.

Particularly, representatives of the stakeholder groups of students, teaching staff, quality management (QM) staff, and higher education institution (HEI) leadership were asked which of the following features apply to the 25 presented quantitative data ("core data"), which are listed in Table 1a: "indispensable", "useful", "useless" as well as "regularly collected in my HEI", "occasionally collected in my HEI" and "not collected in my HEI". Respondents also had the choice of answering "do not know". Moreover, respondents had an option to give open answers and add any comments or make further suggestions.

Table 1a: Surveyed performance data items ("core data")

Core data, selection of "the more uncommon or less widespread or novel items" from a more comprehensive set of core data	
L&T Environment	
Student interactions	Number & duration of student interactions with student admission system (SAS) (**PDRLA**)
	Number & duration of student interactions with student information system (SIS) (**PDRLA**)
	Number & duration of student interactions with students (e.g. via the HEI's learning management system - LMS) (**PDRLA**)
Attraction of master & doctorate students	Number of master students who graduated at another institution
	Number of doctorate students who graduated at another institution
Teaching Competences & Processes	
Quality of teaching staff	Number of teaching staff who participated in formal pedagogical training
	Number of teaching staff who were awarded for their outstanding engagement in teaching based on a merit system
	Number of refereed publications during a certain period of time [TBD] per full time equivalent members of teaching staff
	Number of papers or reports presented at academic conferences during a certain period of time [TBD] per full time equivalent members of teaching staff
Learning Competences & Processes	
Quality learning & student engagement	Number & duration of student interactions with course activities (e.g. solution of exercises, watching videos, listening to lecture, participation in working groups, etc.) (e.g. via the HEI's LMS) (**PDRLA**)
	Number & duration of student interactions with course contents (e.g. via the HEI's LMS) (**PDRLA**
	Number of repetitive visits to learning contents (e.g. during online learning) (**PDRLA**)
Learning Outcomes & Learning Gain & their Assessment	
Assessment of learning outcomes	Percentage of credits given in service-learning activities (e.g. students in community service activities & social work), in relation to total number of credits
Contact with work environment	Number of Bachelor degree theses made in cooperation with industry/external organisations
	Number of Master degree theses made in cooperation with industry/external organisations
Gender balance in the transition from students to doctorate graduates	Ratio of female to male students who complete a doctorate
Employability	Number of Bachelor graduates who within a period of time [TBD] after graduation are unemployed
	Number of Bachelor graduates who found their first job (after graduation) in the region where the HEI is located
	Number of Bachelor graduates who within a period of time [TBD] after graduation are enrolled in further study
	Number of Master graduates who within a period of time [TBD] after graduation are unemployed
	Number of Master graduates who found their first job (after graduation) in the region where the HEI is located
	Number of Master graduates who within a period of time [TBD] after graduation are enrolled in further study
	Number of doctorate graduates who within a period of time [TBD] after doctorate are unemployed
	Number of doctorate graduates who found their first job (after doctorate) in the region where the HEI is located
	Number of doctorate graduates who within a period of time [TBD] after doctorate are enrolled in further study
Space for additions and comments	
Other, namely ……………………………………………………………………………………………………	

Students' assessment

Figure 1 shows the average answer given in both scales by students in four groups of items. Three of them were rated higher on the scale of usefulness than degrees of collecting data , which may result from a lack of knowledge about the data collected by the JU. In the case of the fourth group, "Learning Competences and Processes",

the average answers are higher on the scale of degrees of collecting data than usefulness.

Figure 1: Average usefulness and average degrees of collecting data ("core data") related to university quality performance in L&T as assessed by students.

At this level of data aggregation, the average student responses are quite different from the average responses of the teachers or quality management staff. In the opinion of students, unlike teachers, the relative usefulness is assessed higher than the degrees of collecting data in all categories except "Learning Competences & Processes", that are filled with unused data.

Figure 2 shows the contingency matrix of individual answers given by students on both scales. It contains all possible answers, including "Do not know", as well as additional items proposed during the discussion (mentioned later). The first row and the first column are specific because they indicate that the question is not answered. The diagonal from the upper left corner to the lower right corner indicates the balance between perceived usefulness and degrees of collecting data. The fields below the diagonal refer to the items rated as "not sufficiently collected", while the fields above the diagonal refer to the items assessed as "collected too heavily". It is worth emphasizing that the dominant students' response in the usefulness scale is safe central value.

Additional items proposed in the group of students were formulated as follows:

- Median salaries of graduates in the period of three years after graduation.
- The number of students participating in student organizations for the university.

Figure 2: Matrix of answers given by students on the scale of usefulness and the scale of degrees of collecting data , related to core data.

	Assessed degree of collection of data				
	Do not know	Not collected in my HEI	Occasionally collected in my HEI	Regularly collected in my HEI	Sum
Do not know	1	0	0	0	1
Useless	4	3	0	2	9
Useful	19	16	28	29	92
Indispensable	6	4	4	13	27
Sum	30	23	32	44	129

The contingency matrix (Figure 2) allows the answers to be grouped into several typical "critical" groups. The relatively most frequently indicated elements of the questionnaire in these groups are listed below (with their frequency given in brackets).

Group 1: Useful but not sufficiently collected data (usefulness > (degree of) collection of data):

- Number & duration of student interactions with course contents (e.g. via the HEI's LMS) (3)
- Number of teaching staff who participated in formal pedagogical training (3)

Group 2: Collecting data too heavily ((degree of) collection of data > usefulness):

- Number of refereed publications during a certain period of time [TBD] per full time equivalent members of teaching staff (3)
- Number of teaching staff who were awarded for their outstanding engagement in teaching based on a merit system (3)
- Ratio of female to male students who complete a doctorate (3)

Group 3: No assessment ("do not know"):

- Number & duration of student interactions with student information system (SIS) (3)
- Number & duration of student interactions with students (e.g. via the HEI's learning management system – LMS) (3)

Among the additional statements of the respondents, the following were considered significant:

- Reports on the student interactions with the admission system can be used for marketing purposes, checking candidates' interest in the offer of the JU, assessing its attractiveness or intuitiveness of the Central Recruitment System (called ERK). However, this type of data is not directly related to L&T.
- Verification of the number or duration of student interactions with IT systems can be used to monitor the tools offered by the JU. Those who do not enjoy the interest of students, do not need to be supported (e.g. Moodle conversations).
- Evaluation of the scientific activity of teaching staff is required due to the reform of higher education and the classification of the university. However, the current scientific achievements should be assessed, not the professor's previous work.
- Number of repetitive visits to learning contents can be used to check which content is more or less interesting to students.
- Apart from exceptional situations (e.g. work as part of student advising), service-learning activities are not rewarded with ECTS points.
- Counting ratio of female to male students in the context of parity is perceived as "eliminating inequalities by creating inequalities", understood as denying of differences between men and women, while simultaneously attributing greater importance to gender roles than individual competences.

Teachers' assessment

Figure 3 shows the average answer given in both scales by academic teachers in four groups of items. Three of them were rated higher on the scale of degrees of collecting data than usefulness, which in the opinion of respondents is related to the bureaucratization of university life. It is worth emphasizing that the average answers in "L&T Environment" and "Teaching Competences and Processes" scales outweigh the central value. In the case of the fourth group, "Learning Competences and Processes", the average answers indicate a low usefulness and almost unambiguous opinion that such data is not collected at the JU.

Figure 3: Average usefulness and average degrees of collecting data ("core data") related to university quality performance in L&T as assessed by academic teachers.

At this level of data aggregation, the average teacher responses are similar to the average responses of the quality management staff, with a slightly lower response value. Differences are noticeable when we compare the average teacher responses with the average responses of the students, with the opposite balance between usefulness and degrees of collecting data in each category, and a huge difference in the values of "Learning Competences & Processes".

Figure 4 shows the contingency matrix of individual answers given by teachers on both scales. It contains all possible answers, including "Do not know", as well as additional items proposed during the discussion (mentioned later). As before, the first row and the first column are specific because they indicate that the question is not

answered. It is noticeable that in the group of teachers it was much easier to assess usefulness than the actual degrees of collecting data . The diagonal from the upper left corner to the lower right corner indicates the balance between perceived usefulness and degrees of collecting data. Again, the fields below the diagonal refer to the items rated as "not sufficiently collected", while the fields above the diagonal refer to the items assessed as "collected too heavily".

Additional items proposed in the group of teachers were formulated as follows:

- Number of students undertaking work during their studies.
- Number of graduates undertaking work related to their studies.
- Number of students undertaking work in the profession while studying.
- Number of students who do not graduate.
- Number of students for whom Polish is not the first language.
- Usefulness of competences acquired during studies at work.

Figure 4: Matrix of answers given by teachers on the scale of usefulness and the scale of degrees of collecting data, related to core data.

| | Assessed degree of collection of data | | | | |
	Do not know	Not collected in my HEI	Occasionally collected in my HEI	Regularly collected in my HEI	Sum
Do not know	16	0	7	3	26
Useless	20	5	0	2	27
Useful	86	11	11	13	121
Indispensable	24	0	3	13	40
Sum	146	16	21	31	214

(Assessed usefulness of data)

Again, the contingency matrix (Figure 4) allows the answers to be grouped into several typical "critical" groups. The relatively most frequently indicated elements of the questionnaire in these groups are listed below (with their frequency given in brackets).

Group 1: Useful but not sufficiently collected data (usefulness > collection of data):

- Number & duration of student interactions with course contents (e.g. via the HEI's LMS) (3)
- Number of students undertaking work during their studies (2)
- Number of teaching staff who participated in formal pedagogical training (2)

Group 2: Collecting data too heavily (collection of data > usefulness):

- Number of teaching staff who were awarded for their outstanding engagement in teaching based on a merit system (3)
- Number of refereed publications during a certain period of time [TBD] per full time equivalent members of teaching staff (2)
- Ratio of female to male students who complete a doctorate (2)

Group 3: Useless and not collected data:

- Number & duration of student interactions with course activities (e.g. solution of exercises, watching videos, listening to lecture, participation in working groups, etc.) (e.g. via the HEI's LMS) (2)
- Number & duration of student interactions with course contents (e.g. via the HEI's LMS) (2)

Group 4: No assessment of usefulness of data ("do not know):

- Number of Bachelor graduates who found their first job (after graduation) in the region where the HEI is located (4)
- Number of Master graduates who found their first job (after graduation) in the region where the HEI is located (4)
- Number of doctorate graduates who found their first job (after doctorate) in the region where the HEI is located (3)

Group 5: No assessment of degree of collection of data ("do not know")

- Number & duration of student interactions with student admission system (SAS) (8)
- Number & duration of student interactions with student information system (SIS) (8)
- Number of doctorate students who graduated at another institution (8)
- Number of Bachelor graduates who found their first job (after graduation) in the region where the HEI is located (7)
- Number of doctorate graduates who found their first job (after doctorate) in the region where the HEI is located (7)
- Number of doctorate graduates who within a period of time [TBD] after doctorate are enrolled in further study (7)
- Number of Master graduates who found their first job (after graduation) in the region where the HEI is located (7)
- Number of Master graduates who within a period of time [TBD] after graduation are enrolled in further study (7)

Among the additional statements of the respondents, the following were considered significant:

- The student information system (SIS) can be understood as both an IT system and all activities undertaken for the student in connection with the study program by the university as an institution or by individual teachers, therefore this item should be clearly explained.
- A number of students who graduated at another institution can mean both students who come from other universities and those who are fleeing. Both information may be useful, but they are not the same. This sentence can be explained, e.g. "Number of current students ...", to emphasize that it applies to students who have come from other universities.
- Formal pedagogical training should be regulated by law or internal teacher training is sufficient? This doubt is part of a wider academic discussion on the possibility of unifying requirements for academic teachers. At present, the second option with voluntary pedagogical courses for teachers dominates.
- Number of refereed publications of the teachers is important as long as their discipline is correlated with discipline of conducted classes. This item is

particularly important due to new legal regulations, including the right to conduct studies.

- The number and duration of students' interaction with the course, if they are reliably collected, would be very helpful in planning the workload and ECTS balance for students. The problem creates a reliance on incomplete data (e.g. Moodle reports) or difficult to verify student declarations.
- Creating theses in cooperation with the industry / external organizations has its own bright and dark sides, so it is difficult to see their growing number only in positives.

Quality management staff's assessment

Figure 5 shows the average answer given in both scales by quality management staff in four groups of items. In three of them, the usefulness and degrees of collecting data was assessed at a similar level, with slightly lower average values of "Learning Competences and Processes". The average answers of "Teaching Competences and Processes" indicate a much higher level of collection of performance data in relation to the assumed usefulness of data.

Figure 5: Average usefulness and average degrees of collecting data ("core data") related to university quality performance in L&T as assessed by quality management staff.
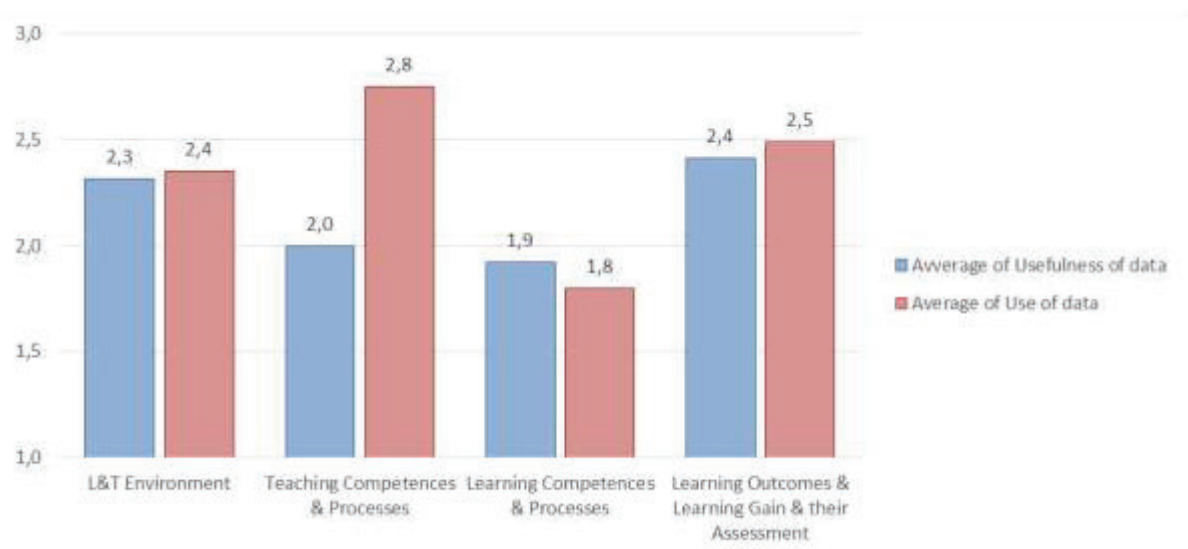
At this level of data aggregation, the average quality management staff responses are similar to the average responses of the teachers, with a slightly higher response value. Differences are noticeable when we compare the average quality management s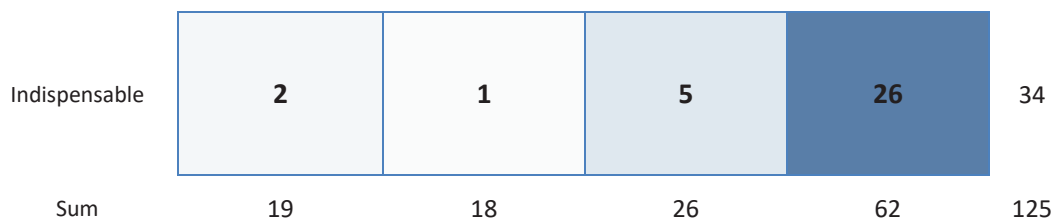taff responses with the average responses of the students, which are similar on the scale of usefulness and almost reversed on the scale of degrees of collecting data.

Figure 6 shows the contingency matrix of individual answers given by quality management staff on both scales. It contains all possible answers, including "Do not know", as well as additional items proposed during the discussion (mentioned later). The first row and the first column are specific because they indicate that the question is not answered. It is noticeable that in the group of quality management staff, the answers "do not know" occur occasionally. The diagonal from the upper left corner to the lower right corner indicates the balance between perceived usefulness and degrees of collecting data . The fields below the diagonal refer to the items rated as "not sufficiently collected", while the fields above the diagonal refer to the items assessed as "collected too heavily".

Figure 6: Matrix of answers given by quality management staff on the scale of usefulness and the scale of degrees of collecting data, related to core data.

	Assessed degrees of collecting data				
	Do not know	Not collected in my HEI	Occasionally collected in my HEI	Regularly collected in my HEI	Sum
Do not know	17	3	4	0	24
Useless	0	4	0	4	8
Useful	0	10	17	32	59

(left axis label: Assessed usefullness of data)

Indispensable	**2**	**1**	**5**	**26**	34
Sum	19	18	26	62	125

The contingency matrix (Figure 6) allows the answers to be grouped into several typical "critical" groups.. The relatively most frequently indicated elements of the questionnaire in these groups are listed below (with their frequency given in brackets).Group 1: Useful but not sufficiently collected data (usefulness > collection of data):

- Number of doctorate graduates who found their first job (after doctorate) in the region where the HEI is located (3)
- Number of doctorate graduates who within a period of time [TBD] after doctorate are enrolled in further study (3)
- Number of doctorate graduates who within a period of time [TBD] after doctorate are unemployed (3)

Group 2: Collecting data too heavily (collection of data > usefulness):

- Number of papers or reports presented at academic conferences during a certain period of time [TBD] per full time equivalent members of teaching staff (3)
- Number of refereed publications during a certain period of time [TBD] per full time equivalent members of teaching staff (3)
- Number of teaching staff who were awarded for their outstanding engagement in teaching based on a merit system (3)

Group 3: Useless and not collected data:

- Number & duration of student interactions with course activities (e.g. solution of exercises, watching videos, listening to lecture, participation in working groups, etc.) (e.g. via the HEI's LMS) (2)
- Percentage of credits given in service-learning activities (e.g. students in community service activities & social work), in relation to total number of credits (2)

Group 4: No assessment of usefulness of data ("do not know):

- Number & duration of student interactions with students (e.g. via the HEI's learning management system - LMS) (2)
- Ratio of female to male students who complete a doctorate (2)

Group 5: No assessment of degree of collection of data ("do not know")

- Ratio of female to male students who complete a doctorate (2)

Among the additional statements of the respondents, the following were considered significant:

- It is not clear what "student information system" (SIS) means, which can be understood as an USOS IT system only or in combination with various communication channels. In a broader sense, interactions can be understood as the exchange of knowledge about an academic educational environment that is difficult to parameterize.
- It is important not only to know the number of students who completed their studies in another institution, but also to diagnose why graduates of the JU undertake studies at other institutions. This problem is related to the student's satisfaction with the university's offer.
- The awards for teachers for their outstanding engagement in teaching is associated mostly with Rector's prizes for teachers highly rated by students.
- All three items in "Quality learning & student engagement" were criticized for blurring the differences between learning and studying. Students are expected to be passionate about self-seeking and understanding of knowledge, not just recipients of content provided by teachers. According to this point of view, the measurement of activities undertaken by the student is pointless, as it assumes limited independence of students.
- Credits given in service-learning activities, in particular with regard to volunteering and practices that develop practical social skills and competences, should be taken into account in study programs. Only few of this type of activity is awarded credit points at JU.
- Ratio of female to male students who complete a doctorate is controversial and gives rise to associations with individual parities that do not take into account individual competencies. One of the respondents considered this item

important, arguing with different life goals of men and women, which may lead to inequality in the face of new legal regulations requiring greater involvement in work at the university.

Additional assessments by active SQELT project participants

In addition to the items presented in Table 1a, the active SQELT project participants were asked for their assessments on further core data, which are depicted in Table 1b.

Table 1b: Further surveyed performance data items ("core data") as assessed by active SQELT project participants

Further surveyed performance indicators supplementing those in Table 2a to build a comprehensive set	
L&T Environment	
Learning resources	Number of book titles held in library
	Number of periodical print subscriptions held in library
	Number of periodical online subscriptions held in library
	Number of student workplaces held in library
	Number & duration of student interactions with library
	Average processing time of a library orders
Teaching resources	Number of Bachelor programs offered
	Number of Bachelor programs that are offered in a foreign language
	Number of joint/dual degree Bachelor programs
	Number of Master programs offered
	Number of Master programs that are offered in a foreign language
	Number of joint/dual degree Master programs
	Ratio of teaching staff number to student number
	Number of female teaching staff
	Number of teaching staff with foreign citizenship
	Number of teaching staff with verified doctorate qualifications (PhD or equivalent)
	Number of teaching staff with verified teaching qualifications
	Number of teaching staff participating in professional development activities
	Number of broad educational subject fields (ISCED97/2011) in which students have graduated in the latest year (disciplinary diversity)
	Number of beds available for teaching in university hospital & affiliated hospitals per 100 students (medicine)
Facilities & equipment	Number of students allowed to enrol in a subject/subject field
	Total institutional expenditure (per full-time student) on ICT for L&T
	Accessible internet bandwidth per student user
	Total institutional expenditure on laboratory resources
	Ratio of students to administrative staff
Financial income & investment	Percentage of total institutional expenditure dedicated to L&T activities (core education expenditure)
	Percentage of total institutional expenditure dedicated to the provision of student services (other than accommodation & student allowance)
	Percentage of total institutional expenditure dedicated to student accommodation & allowance
	Amount of third party funding/extra funding income in L&T per student (e.g. funded research projects for the advancement of L&T)
Student composition & special support	Number of Bachelor students enrolled
	Number of Master students enrolled
	Number of female (& male) Bachelor students enrolled
	Number of female (& male) Master students enrolled
	Number of female postgraduate students
	Number of male postgraduate students
	Number of full-time students
	Number of part-time students
	Number of international students
	Number of international incoming exchange student
	Number of international outgoing exchange students
	Number of students in international joint degree programmes
	Number of students with certain social origins [TBD]
Supportive environment	Number of students who need special access offerings (e.g. because of physical handicaps, dyslexia, autism, visual deficits, …) (personalized data required for Learning Analytics – **PDRLA**)
	Number of students who need support for minorities (**PDRLA**)
	Number of students who use official HEI network options that meet their social, cultural, study interests (**PDRLA**)
	Number of students who use official HEI network options for linking to community/collaborating with the wold of work (e.g. internships) (**PDRLA**)
Quality of incoming students	Grades of student entrance score/secondary school grades (**PDRLA**)
	Grades of university admission tests (**PDRLA**)
	Grades of introductory courses/examinations (e.g. in mathematics) (**PDRLA**)
Teaching Competences & Processes	

Quality of teaching staff	Number of teaching staff who participated in support activities for their adaptation of technology-enhanced L&T
	Number of teaching staff who participated in peer support systems for teaching staff/teaching observation
Learning Competences & Processes	
Quality learning & student engagement	Number & duration of student interactions with course activities (e.g. solution of exercises, watching videos, listening to lecture, participation in working groups, etc.) (e.g. via the HEI's LMS) (**PDRLA**)
	Number & duration of student interactions with course contents (e.g. via the HEI's LMS) (**PDRLA**)
	Number of repetitive visits to learning contents (e.g. during online learning) (**PDRLA**)
Learning Outcomes & Learning Gain & their Assessment	
Student success	Coursework marks (**PDRLA**)
	Number of students who do not complete the program modules they had started (**PDRLA**)
	Number of students who do not successfully complete the first year of study (**PDRLA**)
	Number of students who do not successfully complete undergraduate programs (Bachelor graduation) (**PDRLA**)
	Number of students who do not successfully complete undergraduate programs within the planned program duration (Bachelor graduation on time) (**PDRLA**)
	Number of students who do not successfully complete graduate programs (Master graduation) (**PDRLA**)
	Number of students who do not successfully complete graduate programs within the planned program duration (Master graduation on time) (**PDRLA**)
	Number of students who do not successfully complete their long first degree (long first degree graduation) (**PDRLA**)
	Number of students who do not successfully complete their long first degree within the planned program duration (long first degree graduation on time) (**PDRLA**)
	Number of students who do not successfully complete postgraduate programs (postgraduate graduation) (PDRLA)
	Number of students who do not successfully complete postgraduate programs within the planned program duration (postgraduate graduation on time) (**PDRLA**)
	Number of students who exit HEI per year (**PDRLA**)
	Number of students who exit HEI per year to change to another HEI (**PDRLA**)
Assessment of learning outcomes	Percentage of examinations (e.g. in medical doctor training programmes) which use innovative forms of assessment (e.g. assessment of practical work by faculty & structured clinical cases)
	Examination marks (**PDRLA**)
	Grades of students' final examinations (**PDRLA**)
	Number of Bachelor degrees awarded
	Number of Master degrees awarded
	Number of doctorate degrees (PhD or equivalent) awarded
	Number of doctorate degrees that are awarded to international doctorate candidates
Contact with work environment	Number of Bachelor students actually doing an internship (**PDRLA**)
	Number of Master students actually doing an internship (**PDRLA**)
	Number of Bachelor teaching practitioners from outside the HEI departments
	Number of Master teaching practitioners from outside the HEI departments
Employability	Number of Master graduates who within a period of time [TBD] after their long first degree graduation are unemployed
	Number of Master graduates who within a period of time [TBD] after their long first degree graduation are enrolled in further study

Figure 7 shows the average ratings given in both scales by SQELT project members in four groups. Items from the "L & T Environment" and "Learning Outcomes & Learning Gain & their Assessment" categories are rated best, with higher degrees of collecting data than their usefulness. All items in the category "Learning Competences and Processes" are considered as not collected and useless for the JU. Due to the different pool of items in this version of the questionnaire, comparison of averages with other groups of respondents is pointless.

Figure 7: Average usefulness and average degrees of collecting data ("core data") related to university quality performance in L&T as assessed by SQELT members.

Figure 8 shows the contingency matrix of rates given by SQELT project members on both scales. The first row and the first column are specific because they indicate the lack of knowledge. The diagonal from the upper left corner to the lower right corner indicates the balance between perceived usefulness and degrees of collecting data. The fields below the diagonal refer to the items rated as "not sufficiently collected", while the fields above the diagonal refer to the items assessed as "collected too heavily".

Figure 8: Matrix of answers given by quality management staff on the scale of usefulness and the scale of degrees of collecting data, related to core data.

		Assessed degrees of collecting data			
		Do not know	Not collected in my HEI	Occasionally collected in my HEI	Regularly collected in my HEI	Sum
Assessed usefullness of data	Do not know	2	0	0	0	2
	Useless	0	8	4	2	14

Useful	0	3	45	4	52
Indispensable	0	0	1	33	34
Sum	2	11	50	39	102

The contingency matrix (Figure 8) allows the answers to be grouped into several typical "critical" groups.. All items located in these groups are listed below with additional comments.

Group 1: Useful but not sufficiently collected data (usefulness > collection of data):

- Average processing time of a library orders. The processing time for library orders is not recorded centrally, procedures in the Jagiellonian Library branches may vary.

- Grades of university admission tests. Recruitment for studies takes place on the basis of the results of nationwide exams, although this would be useful when planning the study program.

- Number of teaching staff who participated in support activities for their adaptation of technology-enhanced L&T. Initiatives in this topic, if taken, are not formally registered.

- Number of teaching staff who participated in peer support systems for teaching staff/teaching observation. Initiatives in this topic, if taken, are not formally registered.

Group 2: Collecting data too heavily (collection of data > usefulness):

- Number of book titles held in library. The list of books is available in catalogues, however the status of the Jagiellonian Library makes this information useless.

- Number of female teaching staff. The list of research and teaching staff is publicly available, however gender is not treated as a determinant of competence in Poland.

- Number of teaching staff with foreign citizenship. The list of research and teaching staff is publicly available, however, at JU citizenship is important only for reporting purposes.

- Number of students in international joint degree programmes. Data of all students are processed in the USOS, however the joint degree programs do not have a separate status.

- Number & duration of student interactions with student admission system (SAS). Data of this kind are logged in IT systems, but they are not used in any way.

- Number & duration of student interactions with student information system (SIS). Data of this kind are logged in IT systems, but they are not used in any way.

- Number & duration of student interactions with students (e.g. via the HEI's learning management system – LMS). Data of this kind are logged in IT systems, but they are not used in any way.

- Number of master students who graduated at another institution. Data of all students are processed in the USOS, however they are used only to a limited extent.

- Number of doctorate students who graduated at another institution. Data of all students are processed in the USOS, however they are used only to a limited extent.

- Ratio of female to male students who complete a doctorate. Data of all students are processed in the USOS, however gender is not treated as a determinant of competence in Poland.

Group 3: No assessment ("do not know"):

- Number & duration of student interactions with library. Data of this type are not logged due to the large variety of library points.

- Accessible internet bandwidth per student user. Collecting this kind of data is a technological relic.

- Number of students with certain social origins [TBD]. The processing of this type of personal data is subject to legal restrictions and requires the indication of a specific purpose.

- Number of students who need support for minorities. The processing of this type of personal data is subject to legal restrictions and requires the indication of a specific purpose.
- Number of students who use official HEI network options that meet their social, cultural, study interests. Data irrelevant from the point of view of the whole university, processed locally in an unstructured way.
- Number & duration of student interactions with course activities (e.g. solution of exercises, watching videos, listening to lecture, participation in working groups, etc.) (e.g. via the HEI's LMS). Data irrelevant from the point of view of the whole university, processed locally in an unstructured way, in the context of individual courses.
- Number & duration of student interactions with course contents (e.g. via the HEI's LMS). Data irrelevant from the point of view of the whole university, processed locally in an unstructured way, in the context of individual courses.
- Number of repetitive visits to learning contents (e.g. during online learning). Data irrelevant from the point of view of the whole university, processed locally in an unstructured way, in the context of individual courses.

Group 4 and 5: No assessment of usefulness of data or degree of collection of data ("do not know):

- Coursework marks. This is an ambiguous item, hard to say.
- Examination marks. This is an ambiguous item, hard to say.

It should be emphasized that even in the small group of SQELT project members opinions on the use of particular data were divergent due to different ways of understanding them. Presented assessment of the usefulness and degrees of collecting data should therefore be considered as dynamic.

Stakeholders' assessment of performance indicators

Structured survey about performance indicators

The approached stakeholders were asked to answer individually or discuss in focus groups certain issues and fill in a questionnaire (Table 2a), which is about university performance indicators (PIs), broadly construed, that can be reported for quality

monitoring and improvement in L&T. For example, such PIs may be included in mandatory or non-obligatory quality reporting requirements, target agreements, rankings, etc.

Particularly, representatives of the stakeholder groups of students, teaching staff, QM staff, and HEI leadership were asked which of the following features apply to the 31 presented PIs which are listed in Table 2a: "indispensable", "useful" and "useless" as well as "regularly monitored in my HEI", "occasionally monitored in my HEI" and "not monitored in my HEI". Respondents also had the choice of answering "do not know". Moreover, respondents had an option to give open answers and add any comments or make further suggestions.

Table 2a: Surveyed performance indicators (PIs), broadly construed

Performance indicators, selection of "the more uncommon or less widespread or novel items" from a more comprehensive set of performance indicators	
L&T Environment	
Learning resources	Learning diversity offered with respect to course structures to do justice to different learner types & learning processes (**PDRLA**)
Student interactions	Student interactions with academic advisors (**TBDBE**)
	Student interactions with faculty (e.g. communication, work) outside of class & coursework (**TBDBE**)
Further education & lifelong learning	Compatibility of studies & work (e.g. flexible models for adapting study times to working hours) (**TBDBE**)
	Recognition of non-academic achievements (**TBDBE**)
Stakeholder participation in L&T quality development & evaluation	Student participation in curriculum development
	Employer participation in curriculum development
Teaching Competences & Processes	
Quality teaching & teaching staff engagement	Teaching staff subject-matter competences (**TBDBE**)
	Teaching staff methodological competences (**TBDBE**)
	Teaching staff encouraging students' autonomous thinking & acting (**TBDBE**)
	Fostering sustainability values (social, ecological, economical) (**TBDBE**)
	Teaching staff feedback to students (e.g. on work in progress, test, completed assignments) (**TBDBE**)
Learning Competences & Processes	
Quality learning & student engagement	Student workload (**TBDBE**)
	Activity learning offers (e.g. problem-based learning; research-based learning; internships) (**TBDBE**)
	Provision of training in study skills & self-regulated learning techniques (**TBDBE**)
	Quality flexible learning (flexibility in the requirements, time & location of study, teaching, assessment & certification) (**TBDBE**)
	Quality mobile learning (learning across multiple contexts, through social & content interactions, using personal electronic devices) (**TBDBE**)
	Quality personal (bespoke) learning (**PDRLA**)
Learning Outcomes & Learning Gain & their Assessment	
Constructive alignment of programs/ courses	Design & adjustment of teaching & assessments/examinations to defined intended learning outcomes (**TBDBE**)
Study experience satisfaction	Freshman satisfaction with study experience (**PDRLA**)
	Undergraduate satisfaction with study experience (**PDRLA**)
	Graduate satisfaction with study experience (**PDRLA**)
	Postgraduate satisfaction with study experience (**PDRLA**)
	Alumni satisfaction with study experience/student life cycle (**TBDBE**)
Learning gain	Student learning gain in subject-matter competences (e.g. by comparison of knowledge & skills before & after learning phases) (**PDRLA**)
	Student learning gain in methodological competences (e.g. by comparison of knowledge & skills before & after learning phases) (**PDRLA**)
	Student learning gain in learning strategies (e.g. by comparison of knowledge & skills before & after learning phases) (**PDRLA**)
	Student learning gain in social competences (e.g. team, communication & leadership competences; empathy; ability to cooperate; ability to solve conflicts) (e.g. by comparison of knowledge & skills before & after learning phases) (**PDRLA**)
	Student learning gain in self-competences (e.g. self-determination; capability of decision & learning; flexibility of action; ability to reflect; sovereignty) (e.g. by comparison of knowledge & skills before & after learning phases) (**PDRLA**)
Employability	Possibility of inclusion of work experience & elements related to work practice (**TBDBE**)
	Employer satisfaction with graduates (**TBDBE**)
Space for additions and comments	
Other, namely ……………………………………………………………………….…………………………	

Students' assessment

Figure 9 shows the average answer given in both scales by students in four groups of items. Each of them were rated high on the scale of degrees of collecting data and much lower on the scale of usefulness. These values suggest that in the eyes of students, the university collects a lot of data that it does not use.

Figure 9: Average usefulness and average use of performance indicators ("PIs") related to university quality performance in L&T as assessed by students
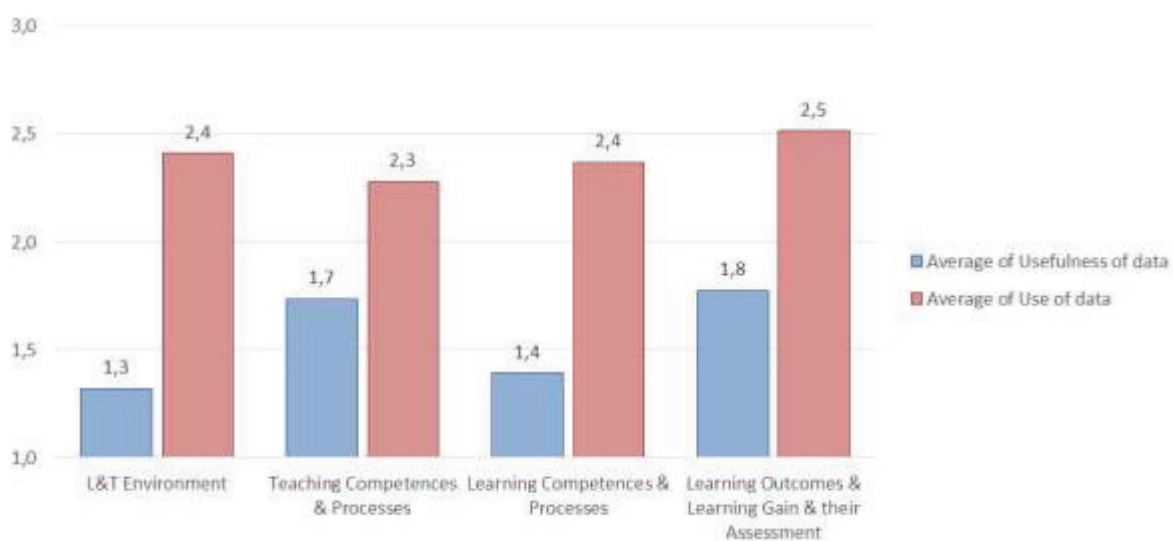
At this level of data aggregation, the average student responses are quite different from the average responses of the teachers or quality management staff. In the opinion of students, unlike teachers, the relative degrees of collecting data is assessed much higher usefulness in all categories.

Figure 10 shows the contingency matrix of individual answers given by students on both scales. It contains all possible answers, including "Do not know", as well as additional items proposed during the discussion (mentioned later). The first row and the first column are specific because they indicate that the question is not answered. The diagonal from the upper left corner to the lower right corner indicates the balance between perceived usefulness and degrees of collecting data. The fields below the diagonal refer to the items rated as "not sufficiently collected", while the fields above the diagonal refer to the items assessed as "collected too heavily". It can be seen that almost all items were considered useful or indispensable by students.

Figure 10: Matrix of answers given by students on the scale of usefulness and the scale of degrees of collecting data, related to performance indicators.

	Assessed degrees of collecting data				
	Do not know	Not collected in my HEI	Occasionally collected in my HEI	Regularly collected in my HEI	Sum
Do not know	5	0	0	0	5
Useless	1	2	6	0	9
Useful	10	24	27	7	68
Indispensable	7	38	23	5	73
Sum	23	64	56	12	155

(row label: Assessed usefullness of data)

The contingency matrix (Figure 10) allows the answers to be grouped into several typical "critical" groups.. The relatively most frequently indicated elements of the questionnaire in these groups are listed below (with their frequency given in brackets).

Group 1: Useful but not sufficiently collected data (usefulness > collection of data):

- Compatibility of studies & work (e.g. flexible models for adapting study times to working hours) (4)
- Learning diversity offered with respect to course structures to do justice to different learner types & learning processes (4)
- Recognition of non-academic achievements (4)
- Teaching staff feedback to students (e.g. on work in progress, test, completed assignments) (4)

Group 2: Collecting data too heavily (collection of data > usefulness):

- Teaching staff subject-matter competences (2)

Group 3: No assessment ("do not know"):

- Fostering sustainability values (social, ecological, economical) (2)

Group 4: No assessment of degree of collection of data ("do not know"):

- Employer participation in curriculum development (3)

Among the additional statements of the respondents, the following were considered significant:

- How to focus on individual students when there are so many of them? This makes it difficult to use different teaching methods.
- University dialogue with students and employers is necessary to maintain a high educational offer. This is done in various ways.
- Nobody promotes sustainability values at JU, but it does not make sense from the perspective of the teacher implementing the curriculum.
- Student learning gain result from individual the abilities of individual students, it does not directly prove the quality of L&T offered by the university. A separate problem is the adjustment of teaching and assessment methods to the intended learning outcomes, i.e. monitoring of internal procedures.

Teachers' assessment

Figure 11 shows the average answer given in both scales by academic teachers in four groups of items. Each of them were rated higher on the scale of usefulness than degrees of collecting data, which shows larger information needs in university life. The smallest difference in averages between scales can be observed in "Learning Competences and Process", which results from the relatively low perceived usefulness of these items. Average answers are close to the central value in both scales.

Figure 11: Average usefulness and average use of performance indicators ("PIs") related to university quality performance in L&T as assessed by academic teachers.

At this level of data aggregation, the average teacher responses are very similar to the average responses of the quality management staff, with a slightly lower response value in "Learning Outcomes & Learning Gain & their Assessment" category. Differences are noticeable when we compare the average teacher responses with the average responses of the students who are convinced that the university collects a lot of data, but does not use it.

Figure 12 shows the contingency matrix of individual answers given by teachers on both scales. It contains all possible answers, including "Do not know", as well as additional items proposed during the discussion (mentioned later). The first row and the first column are specific because they indicate that the question is not answered. It is noticeable that most answers in the group of teachers show lack of information on the actual degrees of collecting data, they were only able to assess the usefulness of indicators. The diagonal from the upper left corner to the lower right corner indicates the balance between perceived usefulness and degrees of collecting data. The fields below are the number of items rated as insufficiently collected, while the field above as collected in excess.

Figure 12: Matrix of answers given by teachers on the scale of usefulness and the scale of degrees of collecting data, related to performance indicators.

| | Assessed degrees of collecting data | | | | |
	Do not know	Not collected in my HEI	Occasionally collected in my HEI	Regularly collected in my HEI	Sum
Do not know	13	0	0	0	13
Useless	10	4	0	0	14
Useful	98	36	22	14	170
Indispensable	26	4	9	12	51
Sum	147	44	31	26	248

Assessed usefullness of data

The contingency matrix (Figure 12) allows the answers to be grouped into several typical "critical" groups.. The relatively most frequently indicated elements of the questionnaire in these groups are listed below (with their frequency given in brackets).

Group 1: Useful but not sufficiently collected data (usefulness > collection of data):

- Teaching staff methodological competences (4)

- Possibility of inclusion of work experience & elements related to work practice (3)
- Teaching staff feedback to students (e.g. on work in progress, test, completed assignments) (3)

Group 2: Collecting data too heavily (collection of data > usefulness):

- Design & adjustment of teaching & assessments/examinations to defined intended learning outcomes (4)

Group 3: No assessment of usefulness of data ("do not know):

- Compatibility of studies & work (e.g. flexible models for adapting study times to working hours) (2)
- Learning diversity offered with respect to course structures to do justice to different learner types & learning processes (2)
- Provision of training in study skills & self-regulated learning techniques (2)
- Quality flexible learning (flexibility in the requirements, time & location of study, teaching, assessment & certification) (2)

Group 4: No assessment of degree of collection of data ("do not know")

- Quality personal (bespoke) learning (8)
- Student learning gain in learning strategies (e.g. by comparison of knowledge & skills before & after learning phases) (7)
- Compatibility of studies & work (e.g. flexible models for adapting study times to working hours) (6)
- Fostering sustainability values (social, ecological, economical) (6)
- Learning diversity offered with respect to course structures to do justice to different learner types & learning processes (6)
- Postgraduate satisfaction with study experience (6)
- Provision of training in study skills & self-regulated learning techniques (6)
- Quality flexible learning (flexibility in the requirements, time & location of study, teaching, assessment & certification) (6)
- Recognition of non-academic achievements (6)
- Student interactions with faculty (e.g. communication, work) outside of class & coursework (6)

- Employer satisfaction with graduates (6)

Among the additional statements of the respondents, the following were considered significant:

- Recognition of non-academic achievements has a formal form of Rector's scholarships.
- A dilemma related to the participation of employers in curriculum development: business would like a university educating future employees, which is in contradiction with the vision of the university as a scientific institution.
- Assessment of teaching staff competences is carried out periodically, but still problematic. The evaluation criteria are constantly discussed, and the organization of peer-reviews is difficult for those assessing the competences of other teachers.
- Flexible learning is an interesting solution, but it is necessary to determine who and under what circumstances could use it without the risk of lowering the level of education.
- Learning outcomes are assessed by accreditation commissions, this is the requirement of the Polish Qualification Framework.
- Freshman satisfaction with study experience was defined by the respondents as a question of why they are staying at the university. Employer satisfaction may be important, but it depends on the specificity of the university unit (e.g. number of graduates) and the study program (general or professional profile).

Quality management staff's assessment

Figure 13 shows the average answer given in both scales by quality management staff in four groups of items. Each of them were rated slightly higher on the scale of usefulness than degrees of collecting data, which shows larger information needs in university life. The highest average values on both scales can be observed in in "Learning Competences and Process" and "Learning Outcomes & Learning Gain & their Assessment" categories.

Figure 13: Average usefulness and average use of performance indicators ("PIs") related to university quality performance in L&T as assessed by quality management staff.
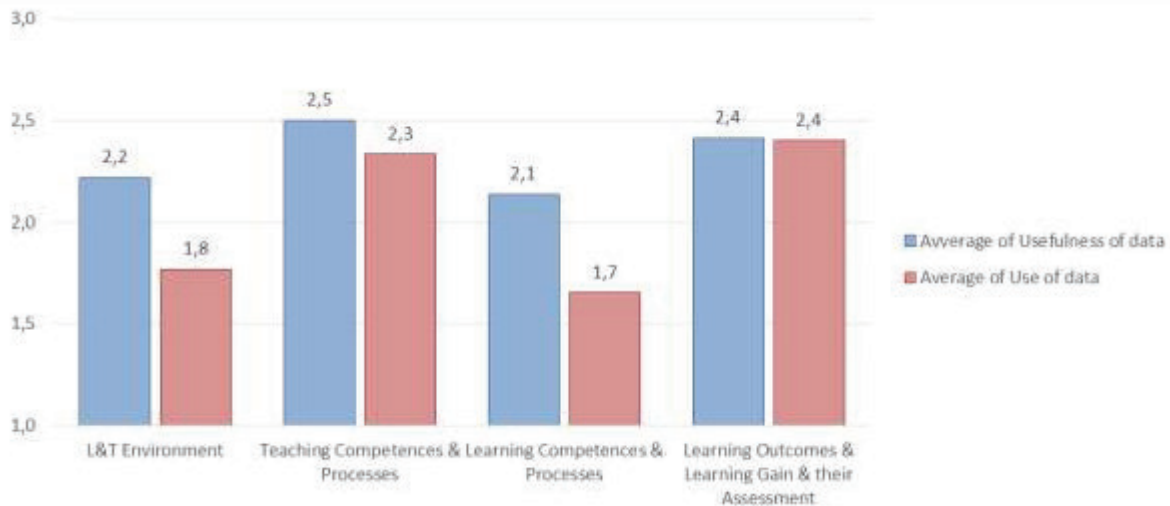
At this level of data aggregation, the average quality management staff responses are very similar to the average responses of the teachers, with a slightly higher response value in "Learning Outcomes & Learning Gain & their Assessment" category. Differences are noticeable when we compare the average quality management staff responses with the average responses of the students who are convinced that the university collects a lot of data, but does not use it.

Figure 14 shows the contingency matrix of individual answers given by quality management staff on both scales. It contains all possible answers, including "Do not know", as well as additional items proposed during the discussion (mentioned later). The first row and the first column are specific because they indicate that the question is not answered. It is noticeable that in the group of quality management staff it was much easier to assess usefulness than the actual degrees of collecting data, although they were able to assess the majority of items in both scales. The diagonal from the upper left corner to the lower right corner indicates the balance between perceived usefulness and degrees of collecting data. The fields below are the number of items rated as insufficiently collected, while the field above as collected in excess.

Additional items proposed in the group of teachers were formulated as follows:

- Students' opinions on the quality of learning.

- Students' opinions about the study offer, courses and learning strategies.
- Students' opinions on the effects of learning.

Figure 14: Matrix of answers given by quality management staff on the scale of usefulness and the scale of degrees of collecting data, related to performance indicators.

| | Assessed degrees of collecting data | | | | |
Assessed usefullness of data	Do not know	Not collected in my HEI	Occasionally collected in my HEI	Regularly collected in my HEI	Sum
Do not know	19	2	0	0	21
Useless	1	10	0	2	13
Useful	16	13	16	22	67
Indispensable	13	9	21	13	56
Sum	49	34	37	37	157

The contingency matrix (Figure 14) allows the answers to be grouped into several typical "critical" groups.. The relatively most frequently indicated elements of the questionnaire in these groups are listed below (with their frequency given in brackets).

Group 1: Useful but not sufficiently collected data (usefulness > collection of data):

- Provision of training in study skills & self-regulated learning techniques (4)
- Fostering sustainability values (social, ecological, economical) (3)
- Learning diversity offered with respect to course structures to do justice to different learner types & learning processes (3)
- Student interactions with faculty (e.g. communication, work) outside of class & coursework (3)

Group 2: Collecting data too heavily (collection of data > usefulness):

- Activity learning offers (e.g. problem-based learning; research-based learning; internships) (2)
- Alumni satisfaction with study experience/student life cycle (2)
- Graduate satisfaction with study experience (2)
- Postgraduate satisfaction with study experience (2)
- Recognition of non-academic achievements (2)
- Student participation in curriculum development (2)
- Student workload (2)
- Teaching staff encouraging students' autonomous thinking & acting (2)
- Teaching staff methodological competences (2)
- Teaching staff subject-matter competences (2)
- Undergraduate satisfaction with study experience (2)

Group 3: No assessment ("do not know"):

- Compatibility of studies & work (e.g. flexible models for adapting study times to working hours) (2)
- Quality flexible learning (flexibility in the requirements, time & location of study, teaching, assessment & certification) (2)
- Quality mobile learning (learning across multiple contexts, through social & content interactions, using personal electronic devices) (2)
- Student interactions with academic advisors (2)

Group 4: No assessment of usefulness of data ("do not know):

- Alumni satisfaction with study experience/student life cycle (2)
- Graduate satisfaction with study experience (2)
- Postgraduate satisfaction with study experience (2)
- Teaching staff feedback to students (e.g. on work in progress, test, completed assignments) (2)

Group 5: No assessment of degree of collection of data ("do not know")

- Employer satisfaction with graduates (3)
- Possibility of inclusion of work experience & elements related to work practice (3)

- Student learning gain in learning strategies (e.g. by comparison of knowledge & skills before & after learning phases) (3)

- Student learning gain in methodological competences (e.g. by comparison of knowledge & skills before & after learning phases) (3)

- Student learning gain in self-competences (e.g. self-determination; capability of decision & learning; flexibility of action; ability to reflect; sovereignty) (e.g. by comparison of knowledge & skills before & after learning phases) (PDRLA) (3)

- Student learning gain in social competences (e.g. team, communication & leadership competences; empathy; ability to cooperate; ability to solve conflicts) (e.g. by comparison of knowledge & skills before & after learning phases) (3)

- Student learning gain in subject-matter competences (e.g. by comparison of knowledge & skills before & after learning phases) (3)

- Teaching staff feedback to students (e.g. on work in progress, test, completed assignments) (3)

Among the additional statements of the respondents, the following were considered significant:

- PIs in the field of Learning Environment should be applicable in the context of an individual offer for students, because the university should enable flexible studies, taking into account the experiences, needs and expectations of students. Practical difficulties may result from the existence of different solutions in study programs, therefore it is necessary to synchronize them between university units to enable accurate measurements.

- Employers have the opportunity to observe students implementing internships and practices. They have the opportunity to observe students who have to perform real tasks and are able to detect individual deficits that are difficult to see within the university walls.

- The assessment of teaching staff competences is carried out mainly on the basis of surveys completed by students at the end of each semester. Other forms of evaluation are used to verify the assessment carried out by students.

- Indicators within Learning Competences & Processes relate partly to the optimization of study programs, partly to the student's motivation to learn and his ability to learn independently in many contexts. For this reason, despite their undoubted importance, these indicators are difficult to measure.

- Learning outcomes are a compulsory part of the description of offered courses.

Additional assessments by active SQELT project participants

In addition to the items presented in Table 2a, the active SQELT project participants were asked for their assessments on further core data, which are depicted in Table 2b.

Table 2b: Further surveyed performance indicators (PIs), broadly construed, as assessed by active SQELT project participants

Further surveyed performance indicators supplementing those in Table 2a to build a comprehensive set	
L&T Environment	
Learning resources	Quality of library services (**TBDBE**)
	Diversity of courses offered (with respect to topics, class options & sizes, time, place, lecturers, etc.) to guarantee that the study programs can be completed within the regular time period (**TBDBE**)
	Quality organization of study programs (e.g. transparency of entrance requirements/admission regulations, access to classes, average class size, completeness of courses offered compared to the study guide, transparency of the examination system) (**TBDBE**)
	Opportunity offers for studying abroad (**PDRLA**)
Teaching resources	Possibility of inclusion of Bachelor study periods abroad
	Possibility of inclusion of Master study periods abroad
Facilities & equipment	Quality of lecture halls & seminar rooms (**TBDBE**)
	Quality of IT services (**TBDBE**)
	Quality of laboratory facilities (**TBDBE**)
Supportive environment	Provision of student support to succeed academically (**TBDBE**)
	Quality of learning support services (e.g. tutoring services, writing centre, student exchange centre, learning management system) (**PDRLA**)
	Measures of encouraging contact among students from different backgrounds (social, ethnic, religious, etc.)
	Provision of opportunities for students to be involved socially (**TBDBE**)
	Provision of student support for managing non-academic responsibilities (e.g. work, family, etc.) (**TBDBE**)
	Provision of student support for overall well-being (e.g. recreation, health care, sports, counselling, etc.) (**TBDBE**)
	Quality offer of campus activities & events for students (e.g. performing arts, sports events, etc.) (**TBDBE**)
	Quality offer for students to attend events that address important social, economic, sustainability, or political issues (**PDRLA**)
	Equity student support (**TBDBE**)
	Institutional recognition of teaching (**TBDBE**)
Student interactions	Student interactions with students (**TBDBE**)
	Student interactions with student services staff (e.g. career services, student activities, housing, etc.) (**TBDBE**)
	Student interactions with other administrative staff & offices (e.g. registrar, financial aid, etc.) (**TBDBE**)
	Student experience in discussions with diverse others (**TBDBE**)
Further education & lifelong learning	Mediation of motivation for lifelong learning (**TBDBE**)
Stakeholder participation in L&T quality development & evaluation	Student participation in student evaluations of courses & teaching (SECT)
	Student participation in decision-making related to student evaluations of courses & teaching
	Teaching staff participation in student evaluations of courses & teaching
	Teaching staff participation in decision-making related to student evaluations of courses & teaching
Teaching Competences & Processes	

Teaching staff workload	Teaching workload of teaching staff (**TBDBE**)
Quality teaching & teaching staff engagement	Teaching quality in general (**TBDBE**)
	Quality organization of course sessions (**TBDBE**)
	Teaching staff respect & interest for students (**TBDBE**)
	Teaching staff pedagogical knowledge & skills (e.g. knowledge of teaching models & learning processes) (**TBDBE**)
	Teaching staff sensitivity to class level & progress (**TBDBE**)
	Teaching staff social competences (e.g. team, communication & leadership competences) (**TBDBE**)
	Bedside teaching (medicine) (e.g. concerning mentoring, suitability of rooms & variety of diagnostic techniques applied) (**TBDBE**)
	Integration of pre-clinical/theoretical & clinical courses (medicine) (**TBDBE**)
	Quality skills labs & training centres (e.g. maintenance, accessibility, technical facilities, mentoring) (medicine) (**TBDBE**)
	Teaching staff satisfaction with teaching quality (**TBDBE**)
Learning Competences & Processes	
Quality learning & student engagement	Course quality (**TBDBE**)
	Training offers to reflect upon student learning approaches (**TBDBE**)
	Student experience of learning quality in general (**TBDBE**)
	Development of student competences of self-learning (**TBDBE**)
	Teaching staff assistance in organising peer learning activities (**TBDBE**)
	Integration of practical experience with patient contact into the study program (medicine) (**TBDBE**)
	Student engagement in general (**TBDBE**)
Learning Outcomes & Learning Gain & their Assessment	
Constructive alignment of programs/ courses	Clearly formulated intended learning outcomes (e.g. goals of study modules & courses) (**TBDBE**)
	Teaching staff awareness of existing intended learning outcomes (**TBDBE**)
Learning gain	Student learning gain in higher-order learning (e.g. by comparison of knowledge & skills before & after learning phases) (**PDRLA**)
	Student learning gain in reflective & integrative learning (e.g. by comparison of knowledge & skills before & after learning phases) (**PDRLA**)
	Student learning gain in quantitative reasoning (e.g. by comparison of knowledge & skills before & after learning phases) (**PDRLA**)
	Student learning gain in collaborative learning (e.g. by comparison of knowledge & skills before & after learning phases) (**PDRLA**)
	Student learning gain in interdisciplinarity (e.g. by comparison of knowledge & skills before & after learning phases)
	Student learning gain in transdisciplinarity (e.g. by comparison of knowledge & skills before & after learning phases)
Assessment quality	Fairness of assessments/examinations
	Timeliness of assessments/examinations
	Quality of assessment/examination formats (**TBDBE**)
Contact with work environment	Possibility of inclusion of internships/ phases of practical experience or external projects in the Bachelor curriculum
	Possibility of inclusion of internships/ phases of practical experience or external projects in the Master curriculum
Employability	Academic & career counselling for students (**TBDBE**)

Figure 15 shows the average ratings given in both scales by SQELT project members in four groups. Items from the "L & T Environment" and "Learning Outcomes & Learning Gain & their Assessment" categories are rated best, with higher degrees of collecting data than their usefulness. All items in the category "Learning Competences and Process" are considered as not collected and useless for the JU. Due to the different pool of items in this version of the questionnaire, comparison of averages with other groups of respondents is pointless.

Figure 15: Average usefulness and average degrees of collecting data ("core data") related to university quality performance in L&T as assessed by SQELT members.
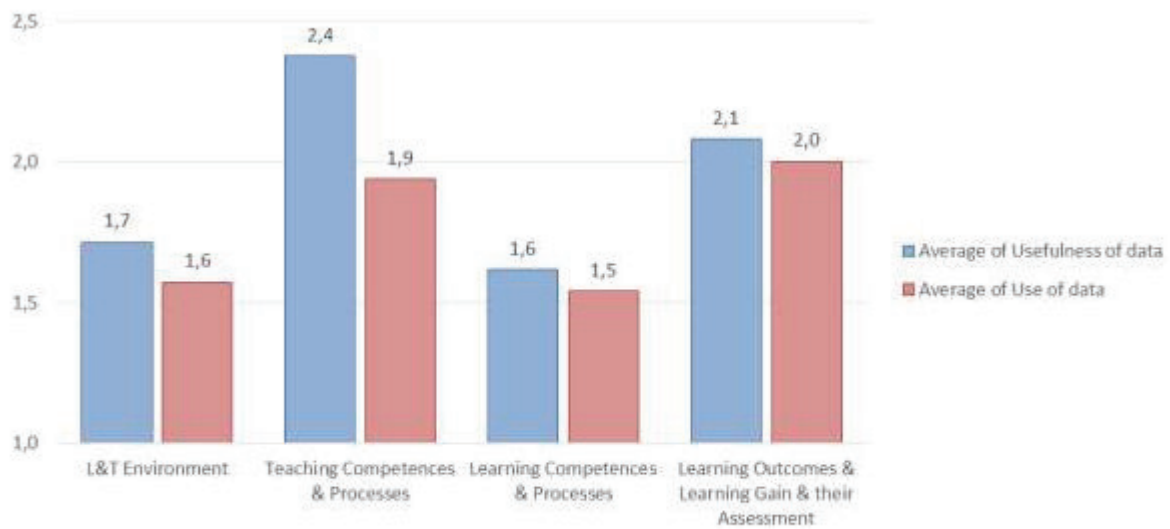

Figure 16 shows the contingency matrix of rates given by SQELT project members on both scales. The first row and the first column are specific because they indicate the lack of knowledge. The diagonal from the upper left corner to the lower right corner indicates the balance between perceived usefulness and degrees of collecting data. The fields below are the number of items rated as insufficiently collected, while the field above as collected in excess.

Figure 16: Matrix of answers given by quality management staff on the scale of usefulness and the scale of degrees of collecting data, related to core data.

		Assessed degrees of collecting data			
		Do not know	Not collected in my HEI	Occasionally collected in my HEI	Regularly collected in my HEI	Sum
Assessed usefulness of data	Do not know	0	0	2	0	2
	Useless	0	15	0	0	17
	Useful	0	9	54	1	62

Indispensable	**0**	**0**	**7**	**3**	10
Sum	0	26	61	4	91

The contingency matrix (Figure 16) allows the answers to be grouped into several typical "critical" groups.. All items located in these groups are listed below with additional comments.

Group 1: Useful but not sufficiently collected data (usefulness > collection of data):

- Quality offer of campus activities & events for students (e.g. performing arts, sports events, etc.). Data of this type are obtained only indirectly and could help improve the university's offer.
- Student interactions with academic advisors. Data of this type are not collected, but it would improve the offer of the university.
- Student interactions with faculty (e.g. communication, work) outside of class & coursework. Data of this type are not collected, but it would improve the offer of the university.
- Student interactions with student services staff (e.g. career services, student activities, housing, etc.). Data of this type are not collected, but it would improve the offer of the university.
- Student interactions with other administrative staff & offices (e.g. registrar, financial aid, etc.). Data of this type are not collected, but it would improve the offer of the university.
- Compatibility of studies & work (e.g. flexible models for adapting study times to working hours). Data of this type are not collected, but it would improve the offer of the university.
- Teaching quality in general. Very important indicator that is used in various ways, but still needs to be improved.
- Teaching staff subject-matter competences. Very important indicator that is used in various ways, but still needs to be improved.
- Teaching staff methodological competences. Very important indicator that is used in various ways, but still needs to be improved.

- Quality organization of course sessions. Indicator important for the offer of study programs, which still needs to be improved.
- Teaching staff respect & interest for students. This indicator is important, but the only source of information is student feedback.
- Integration of pre-clinical/theoretical & clinical courses (medicine). Indicator important for the medical studies, which still needs to be improved.
- Teaching staff satisfaction with teaching quality. Despite the needs reported by teachers, this type of data is not collected.
- Quality mobile learning (learning across multiple contexts, through social & content interactions, using personal electronic devices). Data of this type are not collected, but it would improve the offer of the university.
- Fairness of assessments/examinations. This indicator is important due to the university's transparency, but the possibility of its obtaining is limited.
- Possibility of inclusion of work experience & elements related to work practice. This indicator is important due to the professional context of learning, but the possibility of its application is limited to selected study programs.

Group 2: Collecting data too heavily (collection of data > usefulness):

- Student participation in student evaluations of courses & teaching. Students take part in the evaluation of courses at many levels, including surveys, but the effects of changes are delayed.
- Student learning gain in social competences (e.g. team, communication & leadership competences; empathy; ability to cooperate; ability to solve conflicts) (e.g. by comparison of knowledge & skills before & after learning phases). Shaping social competences is a formal requirement for study programs, but the scope of practical use of this indicator is difficult to solve.
- Student learning gain in self-competences (e.g. self-determination; capability of decision & learning; flexibility of action; ability to reflect; sovereignty) (e.g. by comparison of knowledge & skills before & after learning phases). Shaping self-competences is a formal requirement for study programs, but the scope of practical use of this indicator is difficult to solve.

Group 3: No assessment ("do not know"):

- Measures of encouraging contact among students from different backgrounds (social, ethnic, religious, etc.). The university does not interfere in students' private lives.

- Provision of opportunities for students to be involved socially. The university does not interfere in students' private lives.

- Provision of student support for managing non-academic responsibilities (e.g. work, family, etc.). The university does not interfere in students' private lives.

- Provision of student support for overall well-being (e.g. recreation, health care, sports, counselling, etc.). The university does not interfere in students' private lives.

- Quality offer for students to attend events that address important social, economic, sustainability, or political issues. The university does not interfere in students' private lives and interests.

- Equity student support. Possible privileges related to "social inequalities" are resolved during recruitment.

- Student interactions with students. The university does not interfere in students' private lives and interests.

- Student experience in discussions with diverse others. The university does not interfere in students' private lives and interests.

- Mediation of motivation for lifelong learning. Possible advice in this area is individual, the role of the university is limited to providing opportunities.

- Fostering sustainability values (social, ecological, economical). Activities in this area arise only from the way the teacher conducts classes, there is no general plan.

- Activity learning offers (e.g. problem-based learning; research-based learning; internships). Activities in this area arise only from the way the teacher conducts classes, there is no general plan.

- Training offers to reflect upon student learning approaches. Possible advice in this area is individual, the role of the university is limited to providing opportunities.

- Development of student competences of self-learning. Possible advice in this area is individual, the role of the university is limited to providing opportunities.

- Teaching staff assistance in organising peer learning activities. Activities in this area arise only from the way the teacher conducts classes, there is no general plan.

- Quality flexible learning (flexibility in the requirements, time & location of study, teaching, assessment & certification). Activities in this area arise only from the way the teacher conducts classes, there is no general plan.

Group 4: No assessment of usefulness of data ("do not know):

- Student learning gain in social competences (e.g. team, communication & leadership competences; empathy; ability to cooperate; ability to solve conflicts) (e.g. by comparison of knowledge & skills before & after learning phases). Shaping social competences is a formal requirement for study programs, but the scope of practical use of this indicator is difficult to solve.

- Student learning gain in self-competences (e.g. self-determination; capability of decision & learning; flexibility of action; ability to reflect; sovereignty) (e.g. by comparison of knowledge & skills before & after learning phases). Shaping social competences is a formal requirement for study programs, but the scope of practical use of this indicator is difficult to solve.

It should be emphasized that even in the small group of SQELT project members opinions on the use of particular PIs were divergent due to different ways of understanding them. Presented assessment of the usefulness and degrees of collecting data should therefore be considered as dynamic.

Stakeholders' assessment of quality evaluation instruments

Structured survey about quality evaluation instruments

The approached stakeholders were asked to answer individually or discuss in focus groups certain issues and fill in a questionnaire (Table 3), which is about quality evaluation instruments (QEI) that can be used for quality monitoring and improvement in L&T.

Particularly, representatives of the stakeholder groups of students, teaching staff, QM staff, and HEI leadership were asked which of the following features apply to the 15 presented QEIs which are listed in Table 3: "indispensable", "useful" and

"useless" as well as "regularly applied in my HEI", "occasionally applied in my HEI" and "not applied in my HEI". Respondents also had the choice of answering "do not know". Moreover, respondents had an option to give open answers and add any comments or make further suggestions.

Table 3: Surveyed quality evaluation instruments (QEIs)

Quality evaluation instruments, selection of "the more uncommon or less widespread or novel items" from a more comprehensive set of quality evaluation instruments	
Teaching Competences & Processes	
Quality teaching & teaching staff engagement	Quality procedures of teaching staff recruitment (e.g. responsibilities; recruitment & selection process) for lecturers & associate professors
	Quality procedures of teaching staff recruitment (e.g. responsibilities; recruitment & selection process) for full professors
	Teaching staff peer review or participating observation of courses
Learning Competences & Processes	
Quality learning & student engagement	Reports generated from Learning Analytics tools such as BlackBoard, Moodle, Desire2Learn (e.g. individual user tracking, course based) (**PDRLA**)
	Social network analysis generated from Learning Analytics tools such as SNAPP (Social Networks Adapting Pedagogical Practice) (e.g. visualization of student relationships established through participation in LMS discussions) (**PDRLA**)
	Individual & group monitoring generated from Learning Analytics tools such as GLASS (Gradient's Learning Analytics System) (e.g. visualization of student & group online event activity) (**PDRLA**)
	Discourse analysis generated from Learning Analytics tools such as COHERE (e.g. visualization of social & conceptual networks & connections) (**PDRLA**)
	Student self-reports on their dispositions, values & attitudes towards learning, i.e. collection of learner data & pedagogical descriptors (e.g. students' ability in deactivating negative learning emotions, students' learning strategies) (**PDRLA**)
Learning Outcomes & Learning Gain & their Assessment	
Learning gain	Student dashboards & monitoring generated from Learning Analytics tools such as Student Activity Meter (e.g. visualization of student activity for promotion of self-regulated learning processes) (**PDRLA**)
	Learning content interaction generated from Learning Analytics tools such as LOCO-Analyst (e.g. providing insight into individual & group interactions with the learning content) (**PDRLA**)
Assessment quality	Student evaluation of assessments/examinations (peer grading)
Prediction of student success	Predictive models for student performance
	Predictive models for student attrition
Accreditation	Accreditation (external) of study programs
	Institutional accreditation (external) of QMS in L&T (program accreditation carried out by HEIs themselves)
Space for additions and comments	
Other, namely	

Students' assessment

Figure 17 shows the average answer given in both scales by students in three groups of items. The average answers in "Teaching Competences and Process" category outweigh the central value, other categories are rated lower. In every case,

average answer in scale of degrees of collecting data is higher than average answer in usefulness scale.

Figure 17: Average usefulness and average use of quality evaluation instruments related to university quality performance in L&T as assessed by students.
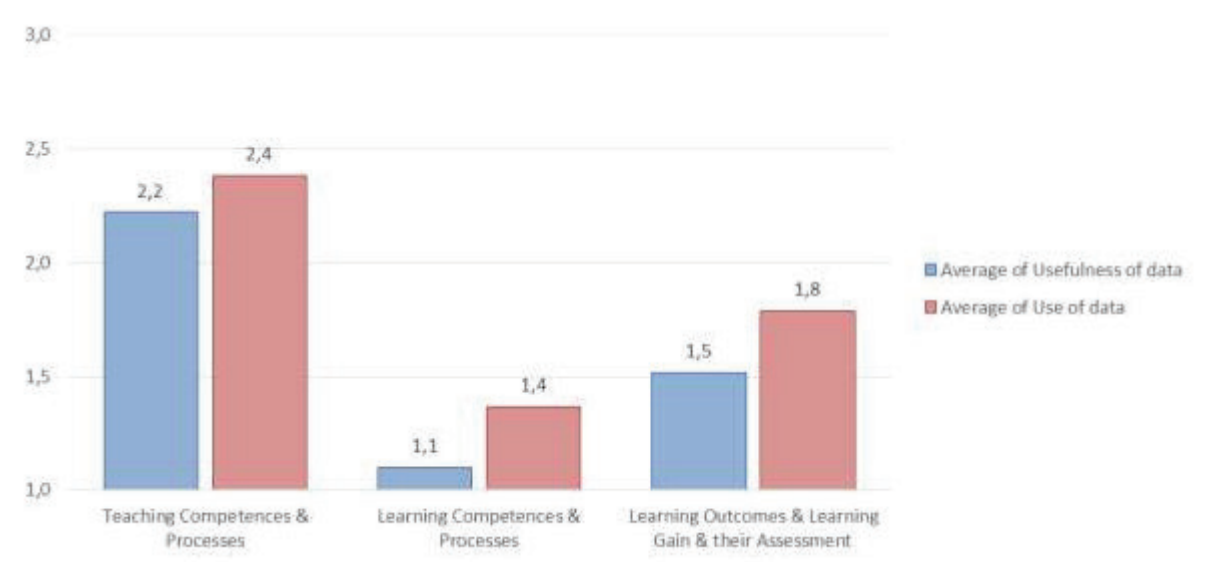
At this level of data aggregation, the average student responses are similar to the average responses of the teachers and the average responses of quality management staff, although in each category, the degrees of collecting data is rated slightly higher than usefulness.

Figure 18 shows the contingency matrix of individual answers given by students on both scales. It contains all possible answers, including "Do not know", as well as additional items proposed during the discussion (mentioned later). The first row and the first column are specific because they indicate that the question is not answered. The diagonal from the upper left corner to the lower right corner indicates the balance between perceived usefulness and degrees of collecting data. The fields below are the number of items rated as insufficiently collected, while the field above as collected in excess.

Figure 18: Matrix of answers given by students on the scale of usefulness and the scale of degrees of collecting data, related to quality assessment instruments.

| | Assessed degrees of collecting data | | | | |
	Do not know	Not collected in my HEI	Occasionally collected in my HEI	Regularly collected in my HEI	Sum
Do not know	9	1	0	0	10
Useless	0	23	0	0	23
Useful	4	17	7	5	33
Indispensable	2	0	2	5	9
Sum	15	41	9	10	75

Assessed usefullness of data (left axis label)

The contingency matrix (Figure 18) allows the answers to be grouped into several typical "critical" groups.. The relatively most frequently indicated elements of the questionnaire in these groups are listed below (with their frequency given in brackets).

Group 1: Useful but not sufficiently collected data (usefulness > collection of data):

- Learning content interaction generated from Learning Analytics tools such as LOCO-Analyst (e.g. providing insight into individual & group interactions with the learning content) (3)
- Student dashboards & monitoring generated from Learning Analytics tools such as Student Activity Meter (e.g. visualization of student activity for promotion of self-regulated learning processes) (3)
- Student evaluation of assessments/examinations (peer grading) (3)

Group 2: Collecting data too heavily (collection of data > usefulness):

- Institutional accreditation (external) of QMS in L&T (program accreditation carried out by HEIs themselves) (3)

Group 3: No assessment ("do not know"):

- Discourse analysis generated from Learning Analytics tools such as COHERE (e.g. visualization of social & conceptual networks & connections) (4)
- Social network analysis generated from Learning Analytics tools such as SNAPP (Social Networks Adapting Pedagogical Practice) (e.g. visualization of student relationships established through participation in LMS discussions) (4)
- Predictive models for student attrition (3)
- Predictive models for student performance (3)

Group 4: No assessment of usefulness of data ("do not know):

- Individual & group monitoring generated from Learning Analytics tools such as GLASS (Gradient's Learning Analytics System) (e.g. visualization of student & group online event activity) (2)

Group 5: No assessment of degree of collection of data ("do not know"):

- Quality procedures of teaching staff recruitment (e.g. responsibilities; recruitment & selection process) for full professors (3)
- Quality procedures of teaching staff recruitment (e.g. responsibilities; recruitment & selection process) for lecturers & associate professors (3)

Among the additional statements of the respondents, the following were considered significant:

- Tools mentioned in the questionnaire (Quality learning & student engagement) aroused doubts of the respondents regarding their practical use as well as the ethical character (which was summarized by comparing the idea with Orwell's dystopia). A possible application could only have a qualitative aspect that focuses on learning about the interests and the way students learn.
- Predictive models can be a temptation for the university to weed out some students instead of educate them. Such solutions may be acceptable in the recruitment process only not after it (for example in competence tests).

Teachers' assessment

Figure 19 shows the average answer given in both scales by academic teachers in three groups of items. The average answers in "Teaching Competences and Process" and "Learning Outcomes & Learning Gain & their Assessment" categories outweigh the central value. In the case of the third group, "Learning Competences and Process", the average answers are visibly lower.

Figure 19: Average usefulness and average use of quality evaluation instruments related to university quality performance in L&T as assessed by academic teachers.
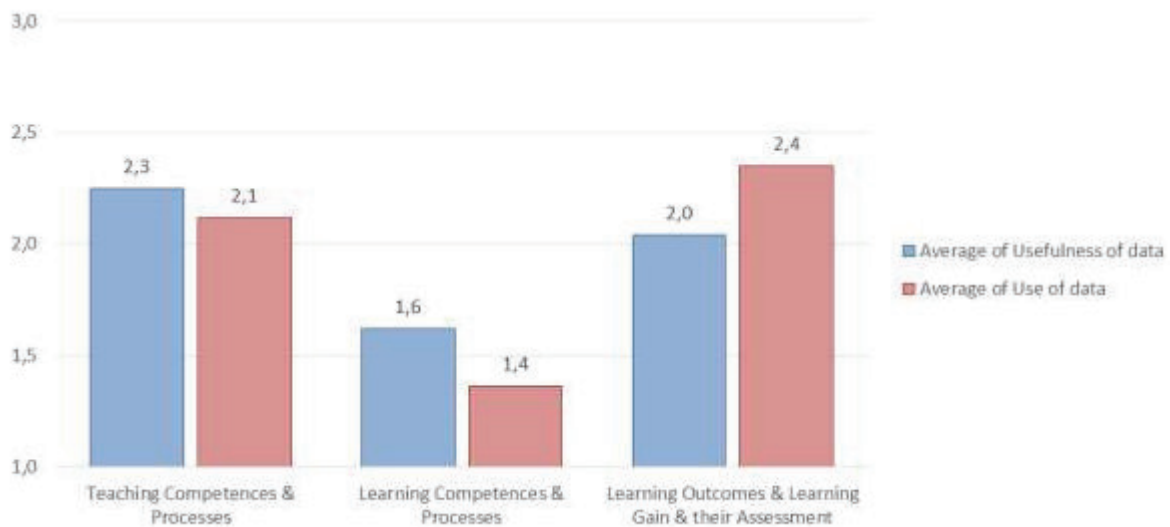
At this level of data aggregation, the average teacher responses are similar to the average responses of the quality management staff, with a slightly lower response value of "Learning Outcomes & Learning Gain & their Assessment" category. Similarity is also noticeable when we compare the average quality management staff responses with the average responses of the students who assess lower the usefulness of "Learning Competences & Process" and "Learning Outcomes & Learning Gain & their Assessment" in both scales.

Figure 20 shows the contingency matrix of individual answers given by teachers on both scales. It contains all possible answers, including "Do not know", as well as additional items proposed during the discussion (mentioned later). The first row and the first column are specific because they indicate that the question is not answered. It is noticeable that in the group of teachers it was much easier to assess usefulness

than the actual degrees of collecting data. The diagonal from the upper left corner to the lower right corner indicates the balance between perceived usefulness and degrees of collecting data. The fields below are the number of items rated as insufficiently collected, while the field above as collected in excess.

Figure 20: Matrix of answers given by teachers on the scale of usefulness and the scale of degrees of collecting data, related to quality assessment instruments.

| | Assessed degrees of collecting data | | | | |
Assessed usefulness of data	Do not know	Not collected in my HEI	Occasionally collected in my HEI	Regularly collected in my HEI	Sum
Do not know	35	4	0	0	39
Useless	7	6	0	0	13
Useful	28	6	10	9	53
Indispensable	2	0	4	9	15
Sum	72	16	14	18	120

The contingency matrix (Figure 20) allows the answers to be grouped into several typical "critical" groups.. The relatively most frequently indicated elements of the questionnaire in these groups are listed below (with their frequency given in brackets).

Group 1: Useful but not sufficiently collected data (usefulness > collection of data):

- Teaching staff methodological competences (4)
- Possibility of inclusion of work experience & elements related to work practice (3)

- Teaching staff feedback to students (e.g. on work in progress, test, completed assignments) (3)

Group 2: Collecting data too heavily (collection of data > usefulness):

- Design & adjustment of teaching & assessments/examinations to defined intended learning outcomes (4)

Group 3: No assessment of usefulness of data ("do not know):

- Compatibility of studies & work (e.g. flexible models for adapting study times to working hours) (2)
- Learning diversity offered with respect to course structures to do justice to different learner types & learning processes (2)
- Provision of training in study skills & self-regulated learning techniques (2)
- Quality flexible learning (flexibility in the requirements, time & location of study, teaching, assessment & certification) (2)

Group 4: No assessment of degree of collection of data ("do not know"):

- Quality personal (bespoke) learning (8)
- Student learning gain in learning strategies (e.g. by comparison of knowledge & skills before & after learning phases) (7)
- Compatibility of studies & work (e.g. flexible models for adapting study times to working hours) (6)
- Fostering sustainability values (social, ecological, economical) (6)
- Learning diversity offered with respect to course structures to do justice to different learner types & learning processes (6)
- Postgraduate satisfaction with study experience (6)
- Provision of training in study skills & self-regulated learning techniques (6)
- Quality flexible learning (flexibility in the requirements, time & location of study, teaching, assessment & certification) (6)
- Recognition of non-academic achievements (6)
- Student interactions with faculty (e.g. communication, work) outside of class & coursework (6)

Among the additional statements of the respondents, the following were considered significant:

- Teaching staff peer review is stressful for both parties, the reviewer and the teacher. It is easier when visits are announced, but it reduces the credibility of the assessment.

- The tools proposed in the Learning Competences & Processes category are not known, except for the Moodle platform. For this reason, determining when and how it could be used was difficult for respondents. Short discussion was triggered by the idea of social networks analysis, which on the one hand may be perceived as unlawful surveillance, on the other hand they are of limited use due to the inability to determine the cause of higher or lower activity on platforms (highlighting that only few students use it).

- Student self-reports on attitudes could be useful if it was reliable. An external assessment of the student's condition (by a teacher, adviser) would require fewer students per teacher.

- The idea of using predictive models for students aroused ethical doubts in the respondents' group. Although it can be useful in recruitment process, it can lead to stigmatization of students.

- One of the participants jokingly commented on the indicators proposed in this category as "chips and surveys", suggesting that although the solutions proposed in the questionnaire seem tempting, there is a risk of excessive parameterization.

- Accreditation of study programs is considered as a tiresome part of academic life.

Quality management staff's assessment

Figure 21 shows the average answer given in both scales by academic quality management staff in three groups of items. Only the average answers in "Teaching Competences and Process" outweigh the central value, next two categories are assessed lower on both scales.

Figure 21: Average usefulness and average use of quality evaluation instruments related to university quality performance in L&T as assessed by quality management staff.

At this level of data aggregation, the average quality management staff responses are similar to the average responses of the teachers, with a slightly lower response value of "Learning Outcomes & Learning Gain & their Assessment" category. Small differences are noticeable when we compare the average quality management staff responses with the average responses of the students who assess the usefulness of the "Teaching Competences and Process" and "Learning Outcomes & Learning Gain & Assessment" slightly lower than degrees of collecting data.

Figure 22 shows the contingency matrix of individual answers given by quality management staff on both scales. It contains all possible answers, including "Do not know", as well as additional items proposed during the discussion (mentioned later). The first row and the first column are specific because they indicate that the question is not answered. The diagonal from the upper left corner to the lower right corner indicates the balance between perceived usefulness and degrees of collecting data. The fields below are the number of items rated as insufficiently collected, while field above as collected in excess.

Figure 22: Matrix of answers given by quality management staff on the scale of usefulness and the scale of degrees of collecting data, related to quality assessment instruments.

Assessed degrees of collecting data

	Do not know	Not collected in my HEI	Occasionally collected in my HEI	Regularly collected in my HEI	Sum
Do not know	14	10	0	5	29
Useless	0	14	1	1	16
Useful	2	6	9	1	18
Indispensable	1	1	0	10	12
Sum	17	31	10	17	75

Assessed usefullness of data

The contingency matrix (Figure 22) allows the answers to be grouped into several typical "critical" groups.. The relatively most frequently indicated elements of the questionnaire in these groups are listed below (with their frequency given in brackets).

Group 1: Useful but not sufficiently collected data (usefulness > collection of data):

- Student evaluation of assessments/examinations (peer grading) (3)

- Quality procedures of teaching staff recruitment (e.g. responsibilities; recruitment & selection process) for full professors (2)
- Quality procedures of teaching staff recruitment (e.g. responsibilities; recruitment & selection process) for lecturers & associate professors (2)

Group 2: Collecting data too heavily (collection of data > usefulness):

- Reports generated from Learning Analytics tools such as BlackBoard, Moodle, Desire2Learn (e.g. individual user tracking, course based) (2)

Group 3: No assessment ("do not know"):

- Discourse analysis generated from Learning Analytics tools such as COHERE (e.g. visualization of social & conceptual networks & connections) (2)
- Individual & group monitoring generated from Learning Analytics tools such as GLASS (Gradient's Learning Analytics System) (e.g. visualization of student & group online event activity) (2)
- Learning content interaction generated from Learning Analytics tools such as LOCO-Analyst (e.g. providing insight into individual & group interactions with the learning content) (2)
- Predictive models for student attrition (2)
- Predictive models for student performance (2)
- Social network analysis generated from Learning Analytics tools such as SNAPP (Social Networks Adapting Pedagogical Practice) (e.g. visualization of student relationships established through participation in LMS discussions) (2)
- Student dashboards & monitoring generated from Learning Analytics tools such as Student Activity Meter (e.g. visualization of student activity for promotion of self-regulated learning processes) (2)

Group 4: No assessment of usefulness of data ("do not know):

- Discourse analysis generated from Learning Analytics tools such as COHERE (e.g. visualization of social & conceptual networks & connections) (3)
- Individual & group monitoring generated from Learning Analytics tools such as GLASS (Gradient's Learning Analytics System) (e.g. visualization of student & group online event activity) (3)

- Learning content interaction generated from Learning Analytics tools such as LOCO-Analyst (e.g. providing insight into individual & group interactions with the learning content) (3)
- Predictive models for student attrition (3)
- Predictive models for student performance (3)
- Social network analysis generated from Learning Analytics tools such as SNAPP (Social Networks Adapting Pedagogical Practice) (e.g. visualization of student relationships established through participation in LMS discussions) (3)
- Student dashboards & monitoring generated from Learning Analytics tools such as Student Activity Meter (e.g. visualization of student activity for promotion of self-regulated learning processes) (3)

Group 5: No assessment of degree of collection of data ("do not know"):

- Discourse analysis generated from Learning Analytics tools such as COHERE (e.g. visualization of social & conceptual networks & connections) (2)
- Individual & group monitoring generated from Learning Analytics tools such as GLASS (Gradient's Learning Analytics System) (e.g. visualization of student & group online event activity) (2)
- Learning content interaction generated from Learning Analytics tools such as LOCO-Analyst (e.g. providing insight into individual & group interactions with the learning content) (2)
- Social network analysis generated from Learning Analytics tools such as SNAPP (Social Networks Adapting Pedagogical Practice) (e.g. visualization of student relationships established through participation in LMS discussions) (2)
- Student dashboards & monitoring generated from Learning Analytics tools such as Student Activity Meter (e.g. visualization of student activity for promotion of self-regulated learning processes) (2)

Among the additional statements of the respondents, the following were considered significant:

- Teaching staff peer-review motivates to improve the classes due to possible visitation more than the effects of such visits.

- The tools proposed in the Learning Competences & Processes category are not known, except for the Moodle platform. For this reason, determining when and how it could be used was difficult for respondents.
- The requirements for collecting documentation for the needs of different accreditations are excessive and overburden employees by distracting their attention from science and teaching. It causes aversion to changes and a lack of confidence in new indicators or instruments.

Additional assessments by active SQELT project participants

The active SQELT project participants were also asked for their assessments on the same list of quality evaluation instruments (QEIs) which were presented to the university's respondents, see Table 3.

Figure 23 shows the average ratings given in both scales by SQELT project members in four groups. Items from the "L & T Environment" and "Learning Outcomes & Learning Gain & their Assessment" categories are rated best, with higher degrees of collecting data than their usefulness. All items in the category "Learning Competences and Process" are considered as not collected and useless

for the JU. Due to the different pool of items in this version of the questionnaire, comparison of averages with other groups of respondents is pointless.

Figure 23: Average usefulness and average degrees of collecting data ("quality evaluation instruments") related to university quality performance in L&T as assessed by SQELT members.

Figure 24 shows the contingency matrix of rates given by SQELT project members on both scales. The first row and the first column are specific because they indicate the lack of knowledge. The diagonal from the upper left corner to the lower right corner indicates the balance between perceived usefulness and degrees of collecting data. The fields below are the number of items rated as insufficiently collected, while the field above as collected in excess.

Figure 24: Matrix of answers given by quality management staff on the scale of usefulness and the scale of degrees of collecting data, related to quality evaluation instruments.

		Assessed degrees of collecting data			
		Do not know	Not collected in my HEI	Occasionally collected in my HEI	Regularly collected in my HEI	Sum
Assessed usefullness of	Do not know	0	0	0	0	24

Useless	0	9	0	0	9
Useful	0	0	7	0	7
Indispensable	0	0	0	1	1
Sum	19	9	7	1	17

The contingency matrix (Figure 24) allows the answers to be grouped into several typical "critical" groups.. All items located in these groups are listed below with additional comments.

Group 1: No assessment ("do not know"):

- Reports generated from Learning Analytics tools such as Black Board, Moodle, Desire2Learn (e.g. individual user tracking, course based). Currently, the JU does not use such tools, except the Moodle platform, so data is not collected.

- Social network analysis generated from Learning Analytics tools such as SNAPP (Social Networks Adapting Pedagogical Practice) (e.g. visualization of student relationships established through participation in LMS discussions). Currently, the JU does not use such tools, so data is not collected.

- Individual & group monitoring generated from Learning Analytics tools such as GLASS (Gradient's Learning Analytics System) (e.g. visualization of student & group online event activity). Currently, the JU does not use such tools, so data is not collected.

- Discourse analysis generated from Learning Analytics tools such as COHERE (e.g. visualization of social & conceptual networks & connections). Currently, the JU does not use such tools, so data is not collected.

- Student self-reports on their dispositions, values & attitudes towards learning, i.e. collection of learner data & pedagogical descriptors (e.g. students' ability in deactivating negative learning emotions, students' learning strategies). Currently, the JU does not use such tools, so data is not collected.

- Student dashboards & monitoring generated from Learning Analytics tools such as Student Activity Meter (e.g. visualization of student activity for promotion of self-regulated learning processes). Currently, the JU does not use such tools, so data is not collected.

- Learning content interaction generated from Learning Analytics tools such as LOCO-Analyst (e.g. providing insight into individual & group interactions with the learning content). Currently, the JU does not use such tools, so data is not collected.

- Predictive models for student performance. Currently, the JU does not use such solutions, so data is not collected.

- Predictive models for student attrition. Currently, the JU does not use such solutions, so data is not collected.

It should be emphasized that even in the small group of SQELT project members opinions on the use of particular PIs were divergent due to different ways of understanding them. Presented assessment of the usefulness and degrees of collecting data should therefore be considered as dynamic.

Stakeholders' assessment of Learning Analytics

Structured survey about Learning Analytics

Respondents, focus group and interview participants were presented the commonly used definition that 'Learning Analytics is the measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimizing learning and the environment in which it occurs' (Siemens 2011a; HEC 2016, p. 4).

Then, respondents were asked whether Learning Analytics is put into practice in their HEI. The answer options were "Yes", "No", and "Cannot answer, because …". Placing this question in the survey turned out to be an inappropriate idea, because the first choice of each respondent was "No". Some of them changed this decision after reading the following questions, interpreting it as "basically not, but partly so".

Further questions about Learning Analytics only were addressed at those respondents who answered the question in the affirmative whether Learning

Analytics is put into practice in their HEI. The approached stakeholders (students, teaching staff, QM staff, and HEI leadership) were asked to discuss in focus groups and/or fill in a questionnaire about certain items relating to Learning Analytics, which are depicted in Table 4. The question was "Which of the listed functions of Learning Analytics are realized in you HEI?" Respondents were also asked to give some information and detail about their answer.

Table 4: Surveyed functions of Learning Analytics

Functions of learning analytics, which are realized in universities or not
Supporting concrete pedagogical decisions as actionable results
Supporting the study of learning-related emotions such as enjoyment, curiosity, frustration, or anxiety, & their interactions
Supporting the quality improvement of courses
Supporting the improvement of course design
Supporting the verification of student workload
Supporting the monitoring of students learning progress (stages)
Supporting the prediction of student learning effectiveness/success
Supporting the identification of students failures of study
Supporting the identification of deficits in learning support for students
Supporting the identification of deficits in environment support for students
Supporting the targeted counselling of individual students
Supporting the improvement of admission & recruitment practices
Other, namely……………………………………………………………

In addition, respondents were asked the open questions listed in Table 5.

Table 5: Further open questions addressed at stakeholders

Functions of Learning Analytics in HEIs
In which ways could/can you participate in the development of Learning Analytics?
Which ethical framework or policy for Learning Analytics is available at your HEI (e.g. referring to data privacy, data reliability, control of data access)?
How are appropriate data access controls ensured for different stakeholders?

Finally, the respondents were asked, which strengths, weaknesses, threats and opportunities (SWOTs) they see for Learning Analytics, and how the they would strategically deal with them. Particularly, they were confronted with the questions listed in Table 6.

Table 6: Preliminary SWOT analysis questionnaire for Learning Analytics

What are, in your view, strengths of Learning Analytics?

What are, in your view, weaknesses of Learning Analytics?
What are, in your view, opportunities & threats of Learning Analytics?
What are, in your view, threats of Learning Analytics?
What ideas do you have using the strengths to overcome the weaknesses?
What ideas do you have using the strengths to exploit the opportunities?
What ideas do you have using the strengths to avoid the threats?

Students' assessment

Students, despite their personal involvement in activities for the university, had difficulty understanding the meaning of presented LA definition. They adopted the assumption that these are all the activities of the university, which focus on learning the perspectives of individual students.

Among the functions of the analysis of learning mentioned in the questionnaire, students indicated only few examples of their implementation at the JU, which are listed below.

- Supporting the quality improvement of courses:
  - inviting students to review exams
- Supporting the prediction of student learning effectiveness/success:
  - monitoring the percentage of students who did fail the course
- Supporting the identification of students failures of study:
  - monitoring the percentage of students who did fail the course
  - recognition of language difficulties of foreigners by the teacher
- Supporting the targeted counselling of individual students:
  - teacher's involvement, including inviting students for consultations or adjusting the form of the exam to the student's preferences

Students' participation in creating Learning Analytics at the JU has the following forms:

- activities in student government and other student organizations
- conversations and joint analysis of problems with the university authorities and teachers
- participation in the evaluation of lecturers

Students' knowledge of the ethical framework or policy that may apply to the Learning Analytics at the JU is limited to the General Data Protection Regulation,

which sets out the rules for the processing of personal data. More recently, more restrictions have been introduced, which cause that data access perceived as chaotic and difficult.

Students who were asked to perform a SWOT analysis rated this task as difficult, although they indicated the elements described below.

- Strengths
  - adaptation of the course of studies to individual student requirements
  - possibility of adapting education to the character and skills of individual student
- Weaknesses
  - too many students to introduce individualization
  - threat to differentiate for better and worse students based on the collected information
  - lack of coordination of activities throughout the faculties which in the case of an individualized approach to the student can lead to injustice
- Opportunities
  - not specified
- Threats
  - excessive care for a student may not prepare him for the requirements of the labour market
  - the temptation for the university to interfere in students' private lives
  - differentiation of students on the basis of their individual life difficulties creates inequalities

Teachers' assessment

At the request to present a general opinion on LA at the JU, the teachers first tried to find examples that could be related to the definition presented. Extreme variants of understanding this concept are, on the one hand, a mass parameterization (correlation of everything with everything), and on the other hand a direct and individual contact between the teacher and the student. Between these extremes, there were proposals consistent with the evaluation of study programs, including the

matching of the type of classes and group sizes, the way of assessing internships or the problem of verifying immeasurable aspects of the learning process.

Among the educational functions listed in the survey, the teachers indicated some examples of their implementation at the JU, which are listed below.

- Supporting concrete pedagogical decisions as actionable results:
  - consultations with students with individualized course of study
  - work with the disabled students, work with religious students (case of a Muslim woman who refused compulsory medical research)
  - knowledge about the theoretical basis of second cycle students
- Supporting the study of learning-related emotions such as enjoyment, curiosity, frustration, or anxiety, & their interactions:
  - this form of support requires real contact with the student from the teacher or tutor of the year, who must be able to respond to different conditions, such as psychological crises.
  - comments included in the students' surveys are a useful tool
- Supporting the quality improvement of courses:
  - conversations with student self-government as an institutional intermediary between the university and the student
  - students take part in discussions on the quality and content of courses and study programs
  - student debates, individual and collective applications to the tutor or head of studies
  - surveys conducted among graduates of the faculty and students
  - individual students' opinions, e.g. about literature of the course
- Supporting the improvement of course design:
  - participation of students in the process of creating study programs
  - students are consultants during the preparation of courses
  - students' opinions about the courses they participated in allow to implement necessary changes (e.g. number of hours) in the following year
  - schedule of work during the classes is consulted with students
  - audio-video recording of your classes and subsequent playback allows you to correct your teaching methods
- Supporting the verification of student workload:

- o student surveys or debates are an available source of information
  - o workload monitoring within individual courses, based on information reported by students
- Supporting the monitoring of students learning progress (stages):
  - o conversation with students about materials from previous classes, referring to the earlier material
  - o phase monitoring of students' progress (e.g. partial tests, periodic knowledge check, repetition of tasks using the same tools, reacting when needed)
  - o professional vocational exams
- Supporting the prediction of student learning effectiveness/success:
  - o possible study of trends on large student samples
  - o monitoring attendance and activity in classes
  - o supporting students' initiative and activities
  - o would apply if the entrance examination was reinstated
- Supporting the identification of students failures of study:
  - o monitoring attendance and activity in classes
  - o monitoring of partial grades
  - o individual conversations, e.g. during consultations or on-line correspondence
- Supporting the identification of deficits in learning support for students:
  - o individual conversations, e.g. during consultations or on-line correspondence
  - o encouraging reporting of problems (e.g. misunderstood commands) and restrictions such as language barrier
- Supporting the identification of deficits in environment support for students:
  - o monitoring of infrastructure, equipment and library resources by student surveys and coordinators
- Supporting the targeted counselling of individual students:
  - o consultations for students (with teachers, promoters, tutors)
  - o meetings with professional advisors
  - o specialized consulting (psychological, pedagogical or legal assistance) is available to students

Teachers' participation in creating Learning Analytics at the JU has the following forms:

- to some extent, LA appears in everyday pedagogical practice, but it is difficult to judge how important it is for the university
- analysis of student surveys
- work in program committees and share knowledge during meetings
- indication of a problematic situation and reporting to the appropriate authorities to find a solution

Teachers who have been asked about the ethical framework or policy that may apply to the Learning Analytics at the JU pointed the General Data Protection Regulation, which sets out the rules for the processing of personal data. They also mentioned problematic religious beliefs and dilemma caused by the unclear definition of public information.

Teachers asked to perform the SWOT analysis indicated the elements described below. The content of their statements indicates that, despite the use of the definition of LA, this term is understood in various ways. Respondents also have difficulty classifying propositions as strength or opportunity, as well as weakness or threat.

- Strengths
  - possibility to improve teaching programs and classes
  - acquiring knowledge about the individual student
  - improving the quality of teaching and working conditions
  - opportunity to optimize the study program and courses
  - promoting the idea of sustainable development
- Weaknesses
  - difficulties in obtaining objective, meaningful, reliable and representative data
  - limited credibility of the survey results due to low attendance of students
  - analysis conducted on large groups of students are not able to reflect learning problems resulting from various reasons
  - tendency towards extreme parameterization
  - extensive bureaucracy causing the need to involve additional resources and work
  - far-reaching surveillance
- Opportunities

- o increasing the number of better educated students should reduce the cost of higher education
- o better quality of education because "we know more and we can do better"
- o confidence of students to the teacher
- o developing emotional intelligence and social competences of students and teachers
- o existence of institutional intermediaries in the group of students as "the voice of the people"
- Threats
  - o wasting time and resources to carry out useless analysis of specific factors
  - o the risk of increasing bureaucracy in the life of the university
  - o focus on indicators instead of people
  - o the risk of data leakage or its use for undesirable purposes by the European Union's external agencies
  - o teachers' fear of losing their authority among students, because LA requires a reduction in distance
- Possible ways to overcome weaknesses with strengths
  - o rationalization of funds intended for data collection through the balance of profits and losses
  - o designing reliable analytical tools and professional analytical teams
  - o reducing the number of students in training groups to improve the teacher's contact with each of them
  - o focusing on an individual approach to the student
- Possible ways to exploit the opportunities with strengths
  - o reducing the emphasis on the content of education for the quality of their transfer, development of competences among students
  - o monitoring the satisfaction of students and graduates from the study program
- Possible ways to avoid the threats with strengths
  - o making wise decisions about whether monitoring is right, why we should use it and what its costs are
  - o identify measurable benefits from planned analyses and conduct only those that contribute to them (while maintaining data security rules)

- minimizing the amount of collected data, selecting only the most important indicators
- limiting the number of documents to read and forms to be completed

Quality management staff's assessment

Quality management staff had difficulty understanding the LA definition presented, which in their opinion is too general to be considered as an explanation of specific actions. They also emphasized the problem of the unsystematic data collection in individual units, which results from limited human resources and focusing on specific, current goals.

Among the functions of the analysis of learning mentioned in the questionnaire, quality management staff indicated the following examples of their implementation at the JU:

- Supporting concrete pedagogical decisions as actionable results:
  - introducing problem solving projects into the courses
- Supporting the study of learning-related emotions such as enjoyment, curiosity, frustration, or anxiety, & their interactions:
  - introducing surveys to get feedback from students about the course
  - individual counselling for students
  - monitoring the life situation of students
- Supporting the quality improvement of courses:
  - purchase of equipment and software for specialist courses
- Supporting the improvement of course design:
  - there is only verification of formal correctness, which is a serious weakness
  - replacing lectures with interactive type of classes
- Supporting the verification of student workload:
  - there is only verification of formal correctness, which is a serious weakness
  - verification of student workload by surveys completed by students after each course and changing ECTS in accordance with the results
- Supporting the monitoring of students learning progress (stages):
  - exams, colloquia, discussions and consultations after selected parts of the material

- o personal development is treated as a hidden positive learning effect
- Supporting the identification of students failures of study:
  - o conversation about the student's interests with proposals for changing the subject of studies or specialization
- Supporting the identification of deficits in learning support for students:
  - o feedback from student surveys received every year
- Supporting the identification of deficits in environment support for students:
  - o feedback from student surveys received every year
- Supporting the targeted counselling of individual students:
  - o student discussions and individual conversations with the dean or program coordinator
- Supporting the improvement of admission & recruitment practices:
  - o possibility of enrolling for the winners of a specific competitions

Participation of quality management staff in creating Learning Analytics at the JU has the following forms:

- analysis of student surveys
- reducing time-consuming procedures allows teachers to focus on didactic and research work, not on bureaucracy
- work in program committees

Respondents who have been asked about the ethical framework or policy that may apply to the Learning Analytics at the JU pointed the General Data Protection Regulation, which sets out the rules for data privacy. Access to all data is limited and requires an individual password.

Asked to perform the SWOT analysis, the quality management staff indicated the elements described below. The content of their statements indicates that, despite the use of the definition of LA, this term is understood in various ways. Respondents also have difficulty classifying propositions as strength or opportunity, as well as weakness or threat.

- Strengths
  - o ability of the university to compare teaching methods and verify their effectiveness
  - o highlighting important aspects of teaching and learning

- o being closer to reality, diagnosis as it is
- o LA enables teachers to learn how their work is perceived by students
- Weaknesses
  - o the time needed to collect current data limits their usefulness in a dynamic reality in which the student's perspective is limited to the here and now
  - o tremendous time consumption by growing bureaucracy
  - o lack of a reliable tools for LA
  - o unification of attitudes excludes diversity, which is so important in academic teaching
  - o continuous supervision makes many teachers stress
- Opportunities
  - o current needs of the labour market in which competencies are strongly needed
  - o tendency to overcome fossilized patterns in teaching
  - o optimization of learning methods
- Threats
  - o financial and time costs may be higher than benefits
  - o LA leads to students' lack of civil courage if they express their opinions only in anonymous surveys
  - o focusing on methods not on main goals, teaching content
  - o unclear conclusions from LA activities
- Possible ways to overcome weaknesses with strengths
  - o rewarding ideas for reducing bureaucratic procedures
  - o teachers should know that thanks to LA they can not only solve but also avoid lots of issues
- Possible ways to exploit the opportunities with strengths
  - o highlighting new opportunities for teachers and students
- Possible ways to avoid the threats with strengths
  - o simplification of procedures
  - o encourage students to openly express their opinions, rewarding them for it.
  - o providing individual support for both students and teachers

Active SQELT project participants' assessment

In the opinion of SQELT project members from JU, the Learning Analytics model corresponding with the adopted definition does not exist at the JU. Of the two elements of L&T, more emphasis is placed on "Teaching" as an aspect fully dependent on the university's activities. Students are treated as mature and aware of their own goals, i.e. people who are active, self-determined participants in their study programs, expanding their knowledge and skills. In this sense, the major role of the university is to provide opportunities for development, which is an individual matter. Activities in the field of LA cover some aspects of "Learning" only when they are used to improve the university's offer or are required for reporting. The perspective of an individual student as the main subject of interest takes place at the level of units specialized in advising and support or in a direct relationship between the student and the teacher.

Trying to perform the SWOT analysis with reference to LA understood as acquiring knowledge about learners and their contexts at university level, the SQELT project members from JU indicated the elements described below.

- Strengths

- Opportunities
  - o Quality improvement in L&T: LA offers the opportunity to improve study programs and classes.
  - o Motivating students: Meeting students' expectations and learning their motivation creates an opportunity to modify the university offer in order to build stronger relationship with the environment.
  - o Trends in higher education. Cooperation with universities interested in the idea of LA may result in the development of an attractive solution for the JU.
  - o Legal changes. If specific actions become a requirement, they will be implemented with greater or lesser involvement from the actors.
- Threats
  - o Blurred goal. Activities that are not undertaken voluntarily with a visible benefit to academia can be seen as another burdensome formality.

- Growing bureaucracy. The implementation of any systematic activities may result in the need to extend administrative procedures.
- Costliness of the process. Changing the university's model of operation and the transition from teaching-orientated to learning-orientated requires a precise balance of gains and losses related to LA to protect both financial and human capital.
- Lack of reliable tools. Relying on surveys or self-assessment does not provide objective data justifying the additional use of resources.
- Possible ways to overcome weaknesses, to exploit the opportunities or to avoid the threats with strengths
  - Benefits of implementing LA solutions at the JU are currently not perceived as sufficient to overcome weaknesses and threats or to use opportunities.

Conclusions and recommendations

There are visible differences between groups of respondents in assessing the usefulness and degrees of collecting data, PIs or quality management tools. Unfortunately, the small sample size does not allow to determine whether these differences are systematic in nature or whether they are only a manifestation of the individual experience of respondents. For this reason, it is worth focusing on similar decisions made by them, regardless of their membership in a given group. Basing on the contingency matrices of individual responses in the three blocks of questionnaire, the most frequently repeated in critical areas items are presented below. The frequency of occurrence is given in brackets.

Group 1: Useful but not sufficiently collected data (usefulness > collection of data):

- Student interactions with faculty (e.g. communication, work) outside of class & coursework (15)
- Teaching staff feedback to students (e.g. on work in progress, test, completed assignments) (14)
- Quality personal (bespoke) learning (14)
- Possibility of inclusion of work experience & elements related to work practice (14)
- Number of teaching staff who participated in formal pedagogical training (14)

- Employer satisfaction with graduates (14)

Group 2: Collecting data too heavily (collection of data > usefulness):

- Number of refereed publications during a certain period of time [TBD] per full time equivalent members of teaching staff (11)
- Number of teaching staff who were awarded for their outstanding engagement in teaching based on a merit system (9)
- Ratio of female to male students who complete a doctorate (8)
- Number of papers or reports presented at academic conferences during a certain period of time [TBD] per full time equivalent members of teaching staff (8)
- Number of Bachelor graduates who within a period of time [TBD] after graduation are enrolled in further study (7)

Group 3: No assessment ("do not know"):

- Social network analysis generated from Learning Analytics tools such as SNAPP (Social Networks Adapting Pedagogical Practice) (e.g. visualization of student relationships established through participation in LMS discussions) (8)
- Discourse analysis generated from Learning Analytics tools such as COHERE (e.g. visualization of social & conceptual networks & connections) (8)
- Student dashboards & monitoring generated from Learning Analytics tools such as Student Activity Meter (e.g. visualization of student activity for promotion of self-regulated learning processes) (6)
- Predictive models for student performance (6)
- Predictive models for student attrition (6)
- Number & duration of student interactions with course activities (e.g. solution of exercises, watching videos, listening to lecture, participation in working groups, etc.) (e.g. via the HEI's LMS) (6)
- Individual & group monitoring generated from Learning Analytics tools such as GLASS (Gradient's Learning Analytics System) (e.g. visualization of student & group online event activity) (6)

Group 4: No assessment of usefulness of data ("do not know"):

- Student dashboards & monitoring generated from Learning Analytics tools such as Student Activity Meter (e.g. visualization of student activity for promotion of self-regulated learning processes) (10)
- Learning content interaction generated from Learning Analytics tools such as LOCO-Analyst (e.g. providing insight into individual & group interactions with the learning content) (10)
- Individual & group monitoring generated from Learning Analytics tools such as GLASS (Gradient's Learning Analytics System) (e.g. visualization of student & group online event activity) (10)
- Social network analysis generated from Learning Analytics tools such as SNAPP (Social Networks Adapting Pedagogical Practice) (e.g. visualization of student relationships established through participation in LMS discussions) (8)
- Discourse analysis generated from Learning Analytics tools such as COHERE (e.g. visualization of social & conceptual networks & connections) (8)
- Student self-reports on their dispositions, values & attitudes towards learning, i.e. collection of learner data & pedagogical descriptors (e.g. students' ability in deactivating negative learning emotions, students' learning strategies) (7)

Group 5: No assessment of degree of collection of data ("do not know"):

- Quality personal (bespoke) learning (12)
- Number & duration of student interactions with student information system (SIS) (12)
- Student learning gain in learning strategies (e.g. by comparison of knowledge & skills before & after learning phases) (10)
- Possibility of inclusion of work experience & elements related to work practice (10)
- Number & duration of student interactions with student admission system (SAS) (10)

Groups 1 and 2 are most interesting for the JU, because on the one hand they indicate unmet information needs, and on the other, areas filled with data that can be better managed or eliminated. Group 3 shows extremely irrelevant elements, so it can be helpful in verifying the significance of indicators. In groups 4 and 5 there are

items that were not known to various respondents. This may indicate both their ignorance and the insufficient definition of the proposed data, PIs or tools.

The problem of proper understanding certainly applies to Learning Analytics. This term is not well established, so it would be appropriate to start the study by exploring its possible meanings. Three main ways of understanding LA scope, which appeared in the statements about the JU, are:

a) All activities combined with the study programs offered by the university, which are implemented under various names and for several years related to the concept of quality assurance.

b) An individualized approach to the student, consistent with the pedagogical concept of personalised learning.

c) Vision of the university as a supervisor or sentinel who wants to interfere in the lives of students.

Despite the involvement in the project, the correct meaning of LA is also not clear for SQELT members, as already mentioned. The advantage of this state of affairs was the limited possibility of suggesting answers to respondents.

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