LEISTUNGSBEWERTUNG an HOCHSCHULEN: QUALITY LITERACY, AUSGEWÄHLTE INDIKATORISCHE MODELLE … und jede Menge UNSICHERHEITEN

Performance Assessment at Universities: Quality Literacy, Selected Indicatoric Models … and Loads of Uncertainties

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Smarter University

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- **Uncertainties & Decision Processes**
- **Challenges & Threats for the Contemporary University – multiple sources of uncertainty**
- **Need for Quality Literacy relying on PDCA/SSARPM & Performance Indicators**
- **Selected Indicator Models & their Theoretical Constructs**
- **Performance Indicators: Working Definition & Criteria**
- **Selected exemplary Performance Indicators for L&T – SQELT PI Set**
- **(Assessment) Methods for Gathering PI Information & Data (in higher education)**
- **Conclusions – Uncertainties prevail and will remain – cf. Super-Complexity**

Uncertainties and Decision Processes

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Elizabeth King, **Navigating Uncertainty: Mindful Leadership at Sea**.
Presentation at Conference: International Leadership Association Global Conference 2020,
https://www.researchgate.net/publication/345755869_Navigating_Uncertainty_Mindful_Leadership_at_Sea

Uncertainties and Decision Processes

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- **UNCERTAINTIES** (gradualised): **consciously perceived/assessed** (gradualised) **doubts** regarding the features of structures & processes or the reliability & validity of statements – **any deviation from complete determinism** (Walker et al., 2003)
- Typically, uncertainties arise if relevant **information & data for a decision are**
  - **not completely available** (**non-availability uncertainty**) or
  - **probabilistic or statistical** in nature (**aleatoric uncertainty**)
  - or the **decision-makers are not able to process & interpret the information & data with sufficient accuracy** (**cognitive uncertainty**)
- In case of mathematised uncertainties (probability of occurrence of event & quantified consequences of event available) mathematised decision rules exist (Bayes rule; μ-σ rule; maximin rule; maximax rule; etc.)
- Multiple-hybrid social system of **higher education** (institutions): **performance assessments** are predominantly **qualitative** in nature → **qualitative uncertainties** are **predominant**

Challenges and Threats for the Contemporary University – multiple sources of uncertainties

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Challenges to the University as Functioning Organisation

- **Multiple-hybrid** character (e.g. many tasks, responsibilities and stakeholders, partially in permanent contradiction and competition for all kinds of resources → **Paradoxical, contested subsystems & situations**) – **SUPERCOMPLEXITY** (Barnett, 2000; 2015; van Niekerk, 2016) – **generic uncertainties**
- **Massification** of HE – **systemic uncertainties**
- Growing importance of **Transformative Digitalisation** and **remote** learning and teaching – **systemic uncertainties**
- **Incompetent HEI leaders & managers** (3 types of incompetence: ineffective behavior; dysfunctional b.; unauthentic b.; see Patel & Hamlin 2017) – **systemic uncertainties**
- **Deficient academic self-governance** – **systemic uncertainties**
- Significance decrease of (higher) educational qualifications
- Deficient promotion of young academics & artists
- HE(I)-alien HEI councils
- HE(I)-alien HE politics & politicians
- . . .

Challenges and Threats for the Contemporary University – multiple sources of uncertainties

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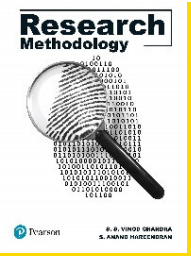
Challenges to the University as Object of Evaluation: Assessment and Measurement of Performance (structures, processes, inputs, outputs)

- **Many different performances** (to look at simultaneously)
- **Many different stakeholder groups & individuals** influencing the system & having specific expectations towards the system
- **Creative & innovative processes** in core performance areas (research; L&T)
- **Complicated L&T processes** (L&T environment; teaching processes; learning processes; learning outcomes & their assessment) in practice relying on **competitive, contested L&T theories** (behaviouristic; cognitivist; social; constructivist; humanistic)
- **Achieved learning outcomes & learning gain not easy to observe & assess** (e.g. impact analysis on level of individual learners)
- . . .



Do contemporary HEIs have the needed QUALITY LITERACY? – ultimately based on performance indicators

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QUALITY LITERACY
Strategy; Management; Practice; Culture

ORGANISATIONAL DEVELOPMENT
via QUALITY ENHANCEMENT
based on various types of evaluations (primarily relying on PDCA cycles)

QUALITY MANAGEMENT SYSTEM

Quality Management Measures
(Scientific methodology; Peer review; Reputation measures; Evaluations; Programme accreditations; Rankings; Benchmarking; Balanced Scorecard; Target agreements etc.)

PERFORMANCE INDICATORS
Assessment of achievements (assurance, enhancement)

Qualitative and quantitative performance data and information

Table 3a. Conceptual framework of quality literacy in higher education, part 1: internal actors, **example** of teachers

Main goals of higher education stakeholders	Quality literacy			
	Quality strategy competencies	**Quality management competencies**	**Quality practice competencies**	**Quality culture competencies**
Teachers aim to enable & support: future competencies including personality development; academic qualification & skills; fitness for employability; fitness for society; fitness for continuing education (comprehensive holistic approach)	Observe permanent requirements for compliance of L&T with - **performance indicator-related** L&T standards - motivating students for **THCSDL** - enhancement orientation - fitness for/of purpose - value for money	Support design & implementation of quality enhancement to meet the requirements for compliance of L&T with - **performance indicator-related** L&T standards - motivating students for **THCSDL** - enhancement orientation - fitness for/of purpose - value for money Show responsibility/ accountability for L&T quality	Apply didactics (e.g. L&T theories; pedagogies) & L&T technologies that foster **THCSDL** & collaborative learning Develop & improve study programmes & courses based on quantitative & qualitative **performance indicators** Participate in **performance indicator-based evaluations of L&T**	**Share espoused values, expectations & commitment to quality (enhancement)** in L&T according to strategic, management & practical competencies Advocate values of **civil rights** & **academic freedom** of L&T which are ultimately based on the **Universal Declaration of Human Rights** (UNGA, 2008) and moral and legal codes in accordance with it

Logic of PI use

PIs are indispensable for governance of quality enhancement & Quality literacy does not have to be completely reduced to PIs or fully mapped by PIs

Concretisation of Quality Literacy: SSARPM as Paradigm of Performance Assessment and Enhancement and Organisational Development (Leiber, 2019a, 324ff.).

	SEVEN-STEP ACTION RESEARCH PROCESS MODEL (SSARPM)
[Prepare]	**[Having in stock models and tools for systemic QM and EBOCD]**
Take stock	**Carrying out stocktaking analysis with respect to existing QM and organisational structures and processes**
Diagnose	**Diagnosing what needs to be changed and developing a strategy including a future vision – PI-based** Challenging the current state and re-examining of the organisation's core issues Recognizing the need or opportunity of change and OD Diagnosing what needs to be changed Gathering and interpreting information Developing a vision and strategy
Activate	**Establishing leadership and activating people – PI-based** Clarifying the role of leadership in OD/QM Clarifying power, politics and stakeholder management Communicating and sharing a change vision and strategy Fostering genuine commitment and enrollment rather than compliance Overcoming change resistance and obstacles such as surprise, shock and denial of decision for change Building change relationships, create guiding coalitions and establish leadership support
Plan (P)	**Planning interventions to achieve desired development – PI-based** Developing a change plan Shaping implementation strategies Clarifying and have in store types of intervention Carrying out appreciative inquiry
Do (D) **Check (C)**	**Implementing change plans and reviewing progress – PI-based** **Carrying out change interventions** Consolidating (short-term) gains and keeping change on track Monitoring and evaluating change progress – PI-based
Act (A)	**Taking action and making change continual and sustainable** Drawing evidence-based action consequences (to close the quality feedback loop (PDCA cycle) by adequate follow-up measures) – PI-based Institutionalising change Anchoring new approaches in organisational culture/quality literacy
	Initiating learning processes Suspending assumptions and entering in genuine thinking together Fostering continual individual and collective learning (**Learning Organisation**)

Logic of PI use

Background: The Value of Evaluation (in Higher Education)

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Scientific evaluation (Stockmann, 2016, 36)

- Clearly defined evaluation object
- Empirical (social science) research methods for information gain
- Assessment according to explicitly determined, intersubjectively provable criteria & systematic (comparative) procedures
- Competent & trained persons (evaluators)
- Oriented towards maintaining and improving the quality of the evaluation object

Four analytically distinctive functions of evaluation (Stockmann, 2016, 38ff.)

- Gaining knowledge
- Exercise of control
- Triggering quality development & learning processes (formative evaluation; learning organization; 'quality as sense-making': Marshall, 2016)
- Legitimation of the evaluated objects

Background: The Value of Evaluation (in Higher Education)

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Four pivotal roles of evaluation in higher education (cf. Eaton, 2003.)

- Sustaining and enhancing the quality of HE
- Maintaining the academic values of HE
- Buffering against the politicizing of HE
- Serving (further) public interest and need

Selected Indicator Models and their Theoretical Constructs (= indicator-based assessment procedures)

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- **Programme Accreditation**
- **Institutional (System) Accreditation**
- International **Research Rankings** (e.g. ARWU, THE, CWTS Leiden, …) (cf. Leiber, 2017)
- (National) **L&T Rankings/Ratings** (e.g. CHE, TEF, …)
- **U Multirank** (international ratings based on users‘ choice)
- **Bibliometrics/scientometrics** (statistical analysis of publications and their citations)
- **Balanced Scorecard** (BSC) (customer; finances; internal processes; learning & growth)
- **SEESs** = Student Experience and Engagement Surveys (e.g. NSSE (US), SES (AUS), SAES (UK), ISSE (IRL), Studierenden(zufriedenheits)befragungen (D), …) (cf. Leiber, 2020)
- **National and international tracer studies**
- **Drop-out surveys**
- (other, occasional) **Evaluations** (of institutes, centres, subject fields, research projects, study programs, QM systems, …)

Selected Indicator Models and their Theoretical Constructs (= indicator-based assessment procedures)

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- **Performance Agreements** between the state & individual universities
- **Performance-oriented allocation of funds** („leistungsorientierte Mittelvergabe“ = LOM) (e.g. incentives to increase performance and the efficient use of resources through competitive distribution based on quantitative performance indicators)
- **Reporting systems** on various administrative levels (e.g. federal level, e.g. “Bildung in Deutschland”; federal states’ levels (Landesberichtssysteme); university level)
- …

- **SQELT comprehensive Performance Indicator Set for L&T** (https://www.evalag.de/sqelt)

Performance Indicators: Working Definition & Criteria

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Performance indicators can be defined as

'concepts that represent **qualitative and quantitative information and data**, which **indicate** functional qualities ('performance') of institutional, organisational or individual performance providers. As such, performance indicators provide information about the **degree** to which **quality performance objectives** [can be or] are being met' (Leiber, 2019b, 77).

PIs can cover a wide range of measures of different complexity: from pure performance figures (quantifications of features ('qualities') of objects or processes; **quantitative PIs**) to complex qualitative performance information, which is based on theoretical model assumptions ('construction') about underlying structures, processes, inputs, outputs (**qualitative PIs**).

PIs are related to **points of reference** such as standards and goals against which the measured PI value and thus the achieved degree of performance or success is assessed

Performance Indicators: Working Definition & Criteria

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PIs must be **useful**, **appropriate**, **fair** and **precise** (also cf. DeGEval, 2016):

- **Usefulness**

  PIs should inform the user in a way that can improve decisions. To be useful, the different goals of PIs, i.e. the information and knowledge requirements of the users, must be clarified in advance. In addition, usefulness also depends on the competences and credibility of those using PIs in assessments and evaluations.

- **Appropriateness**

  The procedures for obtaining data and information for PIs should be appropriate. As a rule, instead of being used in isolation PIs must be used as a group thus grasping the multi-facetedness and interconnectedness of performance issues.

Basic qualities of PIs

Performance Indicators: Working Definition & Criteria

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PIs must be **useful**, **appropriate**, **fair** and **precise** (also cf. DeGEval, 2016):

- **Fairness**

  The collection of data and information for PIs should be planned and carried out in a way that protects the rights, safety and dignity of the persons involved.

- **Precision**

  Survey methods and data sources should be selected in such a way that the reliability of the data obtained and its validity in relation to answering the performance measurement questions are ensured according to professional standards. The technical standards should be based on the quality criteria of empirical research. The sources of information and data used for PIs should be documented with adequate accuracy to assess the reliability and appropriateness of the information and data.

Basic qualities of PIs

Selected Indicator Models and their Theoretical Constructs (= indicator-based assessment procedures)

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PIs should be based on empirical theories about structures & processes (mechanisms) underlying the performances to be measured/indicated, relating the PIs to the theoretical constructs (‘causal operationalisation of theoretical concepts’)

Example: Theoretical ‘construct’ of L&T PIs: L&T theories & processes

- Justifying, Contextualising and Operationalising Performance Indicators of Learning and Teaching: The Role of Theories and Practice of Learning and Teaching (2021;to be published in *Quality in Higher Education*)

  Analyses interweaving of PIs & theories & practice of L&T

  Justification link between PIs and theories of L&T is usually not a straightforward relation but a complicated material inference that is multifactorial on both sides, the premises and the conclusions of the inference

Selected Indicator Models and their Theoretical Constructs

Overview of theories of L&T and their basic characteristics

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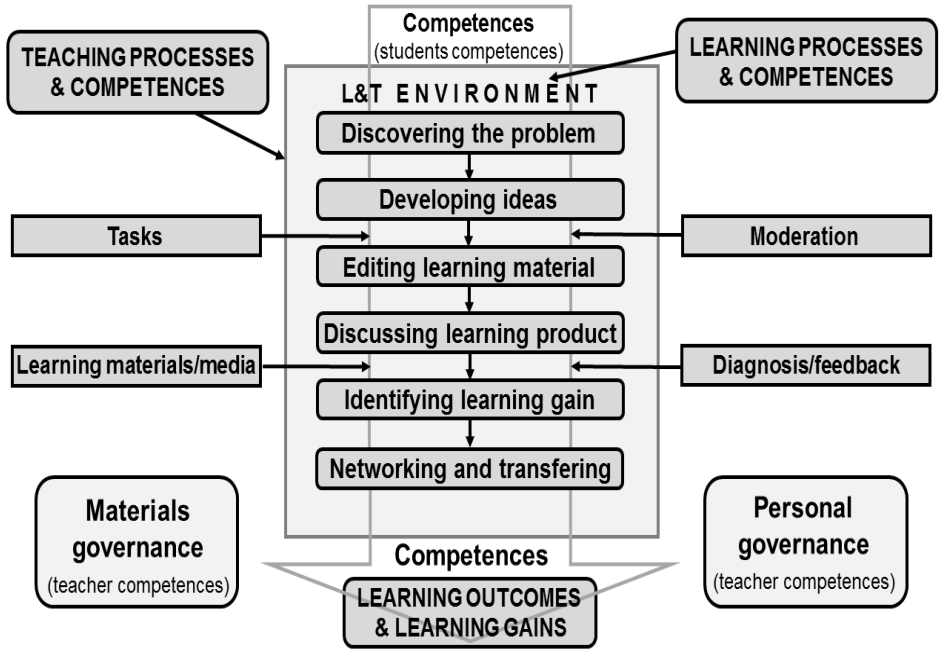
		COGNITIVE & EMOTIVE INFORMATION PROCESSING (CEIP) Atkinson, Davies, Gagné, Shiffrin, Wallace **Computer (programme) models; Developmental psychology models; Neural network models** (e.g. artificial neural networks/Deep Learning)			
Theories of L&T & their advocates	**BEHAVIOURISTIC** Guthrie, Hull, Pavlov, Skinner, Thorndike, Tolman, Watson	**COGNITIVIST** Ausubel, Bruner, Chomsky, (Engeström), Gardner, Koffka, Kohler, Lewin, (Piaget)	**SOCIAL** Bandura, (Boud), Engeström, Eraut, Jarvis, Mezirow, (Piaget), Rotter, Salomon, (Vygotsky), Wenger	**CONSTRUCTIVIST** Boud, Candy, Dewey, Illeris, Kegan, Mead, Mezirow, Piaget, Rogoff, Taylor, von Glasersfeld, Vygotsky	**HUMANISTIC** Maslow, Mezirow, Rogers
Focused purpose of learning/ education	Produce behavioural change in desired direction solely based on input/output observation	Develop cognitive & emotive capacities & skills while emphasising continual reorganisation of these to improve learning abilities	Develop cognitive & emotive capacities & skills while emphasising the relevance of social context; develop new social roles & behaviour	Develop cognitive & emotive capacities & skills while emphasising the constructive activities of learners	Develop cognitive & emotive capacities & skills while emphasising self-determination & autonomous personhood
Mechanisms/ characteris-tics of L&T	**Stimulus/black box/response model**	**Bloom's Taxonomy** (Anderson *et al.*, 2001) (6 cognitive levels: Remember; Understand; Apply; Analyse; Evaluate; Create) **Gagné's Instructional Design** (Gagné *et al.*, 2004) **Multiple Intelligences** (9 learning styles: musical, spatial, linguistic, logical-mathematical, bodily-kinesthetic, interpersonal, intrapersonal, naturalistic, existential) (Gardner, 2011) **Transformative & Holistic Continuing Self-Directed Learning** (THCSDL) theory (Du Troit-Brits, 2018) **Personality models** (e.g. 5-Factor (Big Five) Personality model; John *et al.*, 2008)			
Basic mechanism types	**Linear-(mono-) deterministic, iteratively reinforcing**	**Non-linear multi-layered, multi-causality, probabilistic causality, iteratively reinforcing**			

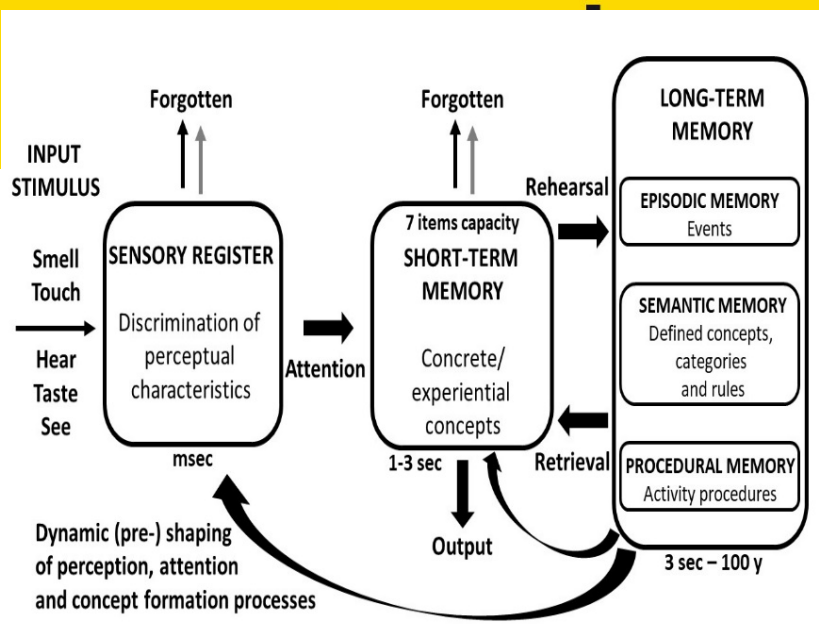
Complementary perspectives with fuzzy demarcations

Selected Indicator Models and their Theoretical Constructs

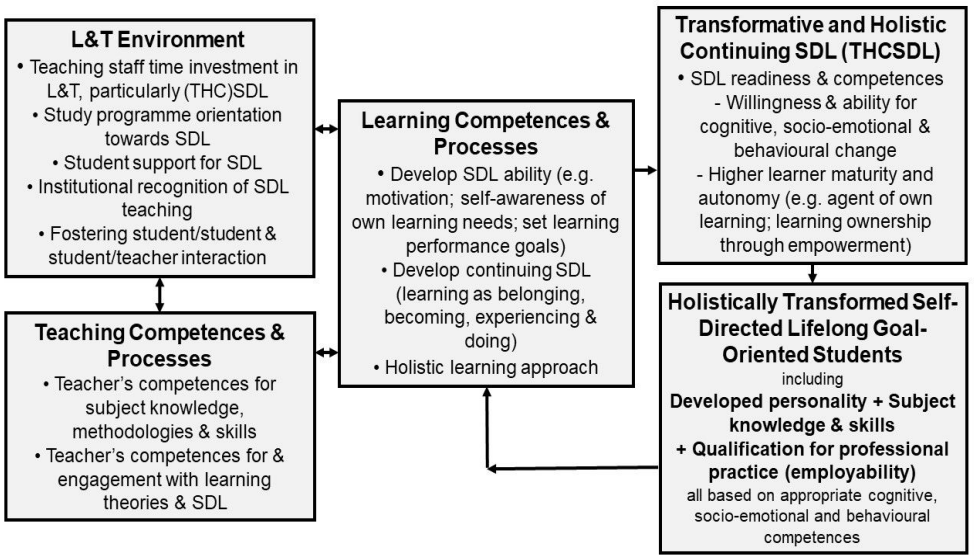
A model of the learning and teaching (L&T) process in (higher) education, schematic (adopted from Leiber, 2019b, 82)



A model of Cognitive and Emotive Information Processing (CEIP) (adopted with modifications from ICTIE, 2006)



Elements of a Transformative and Holistic Continuing Self-Directed Learning (THCSDL) model (revision of Du Toit-Brits, 2018, 55)



Selected Indicator Models and their Theoretical Constructs

Theoretical perspectives, mechanisms and features of L&T performance

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Theoretical perspectives of L&T	General mechanisms and focuses of L&T	Features of L&T performance that can be grasped by certain performance indicators
Behaviouristic perspective	Learning is directly affected by rewards, absence of rewards, or punishment Learning by reinforcement is based on feedback Focus on (changes in) observable behaviour	Observable behavioural performance objectives/outcomes Observable stakeholder satisfaction Performance incentive systems
Cognitive & Emotive Information Processing (CEIP)	Learning by complex internal 'three-level processing' (Sensory Register; Short-term Memory; Long-term Memory; see Fig. 2) and reinforcement (Deep Learning)	Learning according to complex 'three-level processing' Learning as systematic extension of previous knowledge and skills Learning as recursive information processing
Cognitivist perspective	Knowledge and learning are based on symbol manipulation and connection (symbol systems: syntax, semantics) Learning occurs as systemic extension of syntax and semantics of previous knowledge and skills Learners are actively involved in generating knowledge and skills	Active discovery learning (e.g. cooperative learning, problem-based learning, research-based learning, case studies, hands-on experiments) Critical thinking and self-determination

Selected Indicator Models and their Theoretical Constructs

Theoretical perspectives, mechanisms and features of L&T performance

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Theoretical perspectives of L&T	General mechanisms and focuses of L&T	Features of L&T performance that can be grasped by certain performance indicators
Social perspective	Learning is an interactive social process (situated learning; communities of practice; distributed cognition; intercultural experience and learning) Learning goals include transdisciplinary and intercultural competences	Social-in-group and community-based learning (e.g. cooperative & collaborative learning, situated learning, discussion & debates, group work) Student-centredness of L&T Student/teacher & student/student communication
Constructivist perspective	Learning is an interactive social process and knowledge is actively co-constructed in contextualised situations	Responsibility of learners for their learning process (self-directed learning: SDL) Learning performance as a holistic phenomenon Learning as dialogic and recursive processes (e.g. cooperative and collaborative learning, discussion and debates, group work, SDL)
Humanistic perspective	Humans are intrinsically motivated for self-determination, self-actualisation and learning; personality development is core Learning motivation and success depends upon a hierarchy of needs (physiological, psychological, intellectual) Learning involves both affective and cognitive enhancement	Development of self-competences and social competences (personality development, cf. Leiber, 2016) Responsibility of learners for their learning process (SDL) Critical thinking and self-determination Learning performance as a holistic phenomenon Learning as dialogic process

Selected exemplary Performance Indicators for L&T – SQELT PI Set (cf. https://evalag.de/sqelt/) – simplified

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Performance Indicators of Learning & Teaching Environment

NUMBER and/or PERCENTAGE OF STUDENTS WITH NONTRADITIONAL BACKGROUND (exemplary criteria include low-income; non-academic families; disadvantaged ethnic and religious groups) (per higher education institution and/or per department/institute and/or per subject field and/or study programme)

NUMBER and/or PERCENTAGE OF STUDENTS WHO USE NETWORKING OPTIONS PROVIDED BY THE HIGHER EDUCATION INSTITUTION THAT MEET THEIR STUDY INTERESTS (e.g. student research groups)

NUMBER and DURATION OF STUDENT INTERACTIONS WITH TEACHING STAFF IN THE CLASSROOM/ON DIGITAL PLATFORMS/DURING ADDITIONAL ACTIVITIES (per semester/study period)

STUDENTS' ENTRANCE GRADES (per study programme)

STUDENTS' GRADES OF INTRODUCTORY COURSES and/or EXAMINATIONS (e.g. in mathematics, languages) (per study programme)

Selected exemplary Performance Indicators for L&T – SQELT PI Set (cf. https://evalag.de/sqelt/) – simplified

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Performance Indicators of Learning Competences & Processes

STUDENT WORKLOAD (e.g. number of learning hours per semester week, number of courses)

AVERAGE DURATION PER STUDENT INTERACTION WITH COURSE ACTIVITIES
(e.g. solution of exercises, watching videos, listening to lecture, participation in working groups, etc.)

STUDENTS' DISPOSITIONS, VALUES AND ATTITUDES TOWARDS LEARNING
(measured on the basis of learner data and pedagogical descriptors, e.g. learning-related emotions such as enjoyment, curiosity, frustration, anxiety; ability in deactivating negative learning emotions; learning strategies)

STUDENTS' COMPETENCES WITH RESPECT TO LEARNING and SELF-DIRECTED LEARNING (SDL)
(e.g. students' knowledge and understanding of learning theories, own learning processes, problem-based learning, research-based learning, internships, online learning, mobile learning, blended learning)

Selected exemplary Performance Indicators for L&T – SQELT PI Set (cf. https://evalag.de/sqelt/) – simplified

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Performance Indicators of Teaching Competences & Processes

TEACHING STAFF WORKLOAD (e.g. official commitment of teaching hours per semester week, number of teaching hours per semester week, number of courses)

PROPORTION OF TEACHING STAFF WHO PARTICIPATED IN PEDAGOGICAL TRAINING

QUALITY OF RECRUITMENT PROCEDURES FOR LECTURERS/ASSOCIATE PROFESSORS/FULL PROFESSORS
(e.g. procedural responsibilities; recruitment and selection process; recruitment quality criteria)

NUMBER and/or PERCENTAGE OF REFEREED PUBLICATIONS during a certain time period (e.g. three years) per FTE
(full-time-equivalent) member of teaching staff and/or per subject field and/or per study programme

TEACHING STAFF'S DIDACTICS COMPETENCES & PEDAGOGICAL KNOWLEDGE & SKILLS

TEACHING STAFF'S FEEDBACK TO STUDENTS (e.g. on work in progress, tests, completed assignments)

QUALITY OF TEACHING COURSES (e.g. embedding of courses in curriculum, meaningful course structures, options for participation, imparting knowledge and skills, preparedness of teacher)

Selected exemplary Performance Indicators for L&T – SQELT PI Set (cf. https://evalag.de/sqelt/) – simplified

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Performance Indicators of Learning Outcomes and Learning Gain and Their Assessment referring to Future Competencies

STUDENTS' EXAMINATION and ASSESSMENT RESULTS WITH RESPECT TO **SUBJECT-MATTER COMPETENCES** (e.g. final grades; assessments of individual exams and performances such as presentations, homework, workshops within study courses and study modules)

STUDENTS' LEARNING GAIN IN HIGHER EDUCATION FOR **SUSTAINABILITY DEVELOPMENT (HESD) COMPETENCES** (e.g. according to the UNESCO's 17 Sustainability Development Goals)

STUDENTS' EXAMINATION and ASSESSMENT RESULTS WITH RESPECT TO **METHODOLOGICAL COMPETENCES** (e.g. final grades; assessments of individual exams and performances such as presentations, homework, workshops within study courses and study module)

STUDENTS' LEARNING GAIN IN **REFLECTIVE COMPETENCES** (e.g. systemic thinking, forward thinking, critical thinking, self-perception competence)

STUDENTS' LEARNING GAIN IN LEARNING STRATEGIES AND **SELF-LEARNING COMPETENCES** (e.g. knowledge of learning theories and practice; collaborative learning)

STUDENTS' EXAMINATION and ASSESSMENT RESULTS WITH RESPECT TO **QUANTITATIVE REASONING** (e.g. knowledge and skills of mathematical and statistical methodologies)

Selected exemplary Performance Indicators for L&T – SQELT PI Set (cf. https://evalag.de/sqelt/) – simplified

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Performance Indicators of Learning Outcomes and Learning Gain and Their Assessment referring to Future Competencies
STUDENTS' EXAMINATION and ASSESSMENT RESULTS WITH RESPECT TO **INTERDISCIPLINARY COMPETENCIES** (e.g. ability to combine and synthesize knowledge and methodologies from different disciplines)
STUDENTS' LEARNING GAIN WITH RESPECT TO **SOCIAL COMPETENCIES** (e.g. team, communication and leadership competences; empathy; ability to cooperate; ability to solve conflicts)
STUDENTS' LEARNING GAIN WITH RESPECT TO **SELF-COMPETENCIES** (e.g. self-determination; capability of decision and learning (SDL); flexibility of action; ability to reflect; sovereignty)

Dozens or more cases possible (see e.g. SQELT-PI 2020) including further competencies of quality strategy, management, practice and culture (e.g. leadership, academic, intellectual, ethical competencies)

(Assessment) Methods for gathering PI information & data (in higher education)

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- **Peer review** – qualitative
- **Systematic Qualitative Content Analysis (QCA)** (e.g. cf. Mayring, 2020) (and "hermeneutics") applied to
  - Written **documents** – qualitative
  - Transcribed **interviews** (structured, semi-structured, narrative) with different stakeholder groups (e.g. students, teachers, researchers, leadership, QM, politics, employers, parents, …) – qualitative
  - Transcribed **focus group discussions** (semi-structured, narrative) with different stakeholder groups – qualitative
  - Written documented **open survey questions** (paper-and-pencil, online) with different stakeholder groups – qualitative
- **Statistical methods** applied to
  - **Closed questions** (paper-and-pencil, online) – quantitative
- **Bibliometrics** – quantitative

Plenty of sources of uncertainty: conceptual inaccuracies and variances; variances between spoken and written word; mathematical-statistical errors; ….

Conclusions
– ‘Uncertainties’ prevail and will remain – the era of certainty evaporated no later than from around 1800

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Basic causes of assessment/evaluation uncertainties in HE

- **‘Supercomplexity’ of University**
- **Limited ability to (ex ante) assess future possible performance & creativity processes** (e.g. non-funding of creative research)
- **Systematic, generic deficiencies of performance indicator models**
  - **Indicator models are approximative** (model theoretic approach; degree of approximation/decontextualisation often hard to determine)
  - **Performance indicators are proxies** (degree of approximation/ decontextualisation often hard to determine)
- **Limitations of peer review** because of biases & cognitive limitations (complement with aleatoric processes?)

Conclusions
– ‘Uncertainties’ prevail and will remain – the era of certainty evaporated no later than from around 1800

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Basic causes of assessment/evaluation uncertainties in HE

- Vast majority of University performances
  - **Cannot be quantified**, but can only be assessed on basis of **qualitative evaluations → pronounced scope of Qualitative Content Analysis & interpretation**
  - Can only be assessed on basis of **combination of various information and data sources** (e.g. document analysis; surveys of participants & stakeholders; peer reviews; expert assessments; …)

Few basic insights (“truths”) about indicatoric modeling

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- **(Performance) Indicators are indispensable** for orientation & action knowledge & decision-making in modern (super-)complex societies (knowledge societies, eological crisis, globalisation, distribution of wealth, pandemics)

- Conditional (controllable?) **decontextualisation through models is ubiquitous** & **unavoidable** (perspectivism; model-theoretic understanding of knowledge production)

- Of course, they are both, **generators of degrees of confidence in decision-making** & **sources of new uncertainty**

- **General theory** (of the value and efficacy) **of indicators:**
  - **Working definition of PIs**
  - **Quality Literacy incl. SSARPM**
  - **Sub-models defined by various indicator models (‘perspectives’)**

Decision Making under Deep Uncertainty

From Theory to Practice

OPEN

Springer

Vincent A. W. J. Marchau • Warren E. Walker • Pieter J. T. M. Bloemen • Steven W. Popper (Editors), 2019

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Quality Literacy

Performance Indicators

Seven-Step Action Research Process Model (SSARPM)

Quality Enhancement and Organisational Development

Flexible Learning Organisation

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