LUT TEACHER´S
QUALITY MANUAL

LAPPEENRANTA
UNIVERSITY OF TECHNOLOGY
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**Starter’s test**

Check the boxes that describe you and your thoughts:

<table>
<thead>
<tr>
<th>Another pamphlet! What ever for?</th>
<th>To the reader</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constructivism, auditive, taxonomy... Ew, I’m breaking out in hives!</td>
<td>Chapter 2</td>
</tr>
<tr>
<td>There’s one thing I won’t give up: the good old lecture!</td>
<td>Section 3.3.2</td>
</tr>
<tr>
<td>I’ll copy a page from the textbook onto a transparency — they’ll get a chance to practice their penmanship!</td>
<td>Section 3.3.3</td>
</tr>
<tr>
<td>The guy in the office next to mine is constantly updating his web site, and students visit his office all day long. What a waste of time! Study guidance, my foot!</td>
<td>Sections 3.3.3 and 3.4</td>
</tr>
<tr>
<td>The exam is right around the corner... I should probably prepare the questions... and could there be a bigger waste of time than correcting the exam papers?</td>
<td>Section 3.3.4</td>
</tr>
<tr>
<td>Finally! I’m done with my last lecture! Now back to my research, no time for feedback!</td>
<td>Section 3.5</td>
</tr>
<tr>
<td>The professor wanted to see me and told me to go teach. But I don’t know how!</td>
<td>Chapters 1-4</td>
</tr>
<tr>
<td>I’m no less than perfect!</td>
<td>Chapter 4</td>
</tr>
</tbody>
</table>

How many boxes did you check? For useful information, see the references at the end of the rows.

“A teacher’s work means constant learning. Here, you learn by doing. When I think about my very first courses, I undoubtedly knew the topic area very well thanks to my dissertation work, but I have mostly developed with regard to how I teach and how I take into account the applicability of different methods in different types of groups. I teach undergraduate, postgraduate and mature students, and there are great differences between these groups. Each teacher must build their own identity as a teacher. A way of working that is not fake or copied, but unique to them.”

teacher LUTinen
To the reader

This quality manual is a quick guide to good teaching for the teaching staff of Lappeenranta University of Technology. The guide promotes high-quality education at the university by explicating the role of its key actor – the teaching staff. LUT’s main quality manual emphasises the importance of the everyday work of teachers and teacher-student interaction. This guide offers tools for and insights into the implementation and development of one’s own teaching.

At a concrete level, individual teachers are responsible for the courses they teach. The main quality manual of LUT describes the quality targets for courses as follows:

- by the end of the course, students will have achieved the learning outcomes described in the course description; the students’ skills are assessed through assignments, seminar papers, examinations or other applicable methods
- students feel that the course has been organised in an appropriate and suitable way
- students are satisfied with the course as a whole.

This manual deals with the backgrounds of teaching work, describes different alternatives in the implementation of teaching, and provides tips for planning and developing one’s teaching.

Development of education in LUT 2013 strategy

LUT aims high in its strategy: being known for the best university education in technology and business in Finland.

Taking a professional approach to education and its management is one of the targets of the LUT 2013 strategy. Management pays special attention to developing pedagogy and the content of education, and to student recruitment. Degree programmes and courses must be continuously developed to foster high quality and performance.

One of the general targets of university education has always been education based on research. The strategy emphasises that in order to obtain the most recent knowledge, all researchers must teach and all teachers research. In addition, a key policy in the strategy is strengthening the scientific and pedagogical expertise of the teaching staff.

Student feedback has been highlighted in the strategy. A strategic target is that the quality of education is monitored with the help of student feedback, which is collected for each course, analysed, and put into practice. Also lifelong learning and the internationalisation of teaching and studies are underlined in the strategy.

The strategy is available on LUTnet: Tietopankki → Yleishallinto → Strategia
There are two important actors in an educational situation: the student and the teacher. Figure 1 below describes the key principles in the interaction between these actors.

Students are responsible for their own learning:
- The key activity in an educational organisation is the student’s learning process.
- The learning process generates learning, which is needed and utilised in different situations in the surrounding society.
- Students are responsible for their own studies, their own learning achievements and the learning that results from their studies; no one can produce competences for someone else.
- The background knowledge and skills a student possesses have a strong impact on the student’s future competences.

Teachers’ teaching procedures aim to facilitate learning:
- Teachers only have an indirect impact on learning through the student’s studies.
- Teachers provide a framework for carrying out Studies and support students’ learning in different ways; especially assessment methods have a great impact on the kind of competence a student develops.
- Teachers do not operate in a void, but as a part of the university community, and university-wide policies play a part in defining the role, duties and resources of the teaching staff.

![Figure 1. Competences are created through cooperation between the student and the teacher.](image)

### 2 Teaching and learning

#### 2.1 What is good teaching?

Good teaching may also be referred to as constructive alignment (Löfström et al. 2006), and it supports the deep learning of students. Constructive alignment refers to the connection between all key elements of education, learning outcomes, teaching methods and student assessment. By making sure that all of the elements work towards the same goal, teachers can ensure that their teaching is successful.
"We had lots of assignments and interesting group work and reflection during the course. I realised that it’s good to think about things together because there is always one in the group who has a bright idea even if all of the others draw a blank. I got excited about the topic and found it easy to learn… After the course we had a regular exam in a big auditorium, which determined the grade for the course. The exam was on some book and a couple of handouts. It made no sense – the course itself and the exam were from completely different planets, and the grade was based only on the exam!"

Brian Kottarainen, LUT

In the case above, the methods for student assessment were not aligned with the learning outcomes and teaching methods. Moreover, the assessment did not support students’ learning in the desired way. Constructive alignment is based on the constructivist concept of learning (see Section 2.3), the key features of which include e.g. that

- students handle knowledge actively, and are not merely passive recipients
- learning something new is based on prior learning
- learning takes place in interaction and dialogue between people because learning is a social phenomenon.

When you examine your own teaching, you should ask yourself the following questions:
- What contents should I deal with in my teaching?
- What are the learning outcomes of my course?
- What kinds of teaching methods best suit the contents taught and promote the achievement of the learning outcomes?
- How should students’ knowledge and skills be assessed in order for the assessment to support learning?

These issues are dealt with in more detail in Chapter 3.

2.2 What is good learning and knowledge?

Good learning is meaningful, profound, and aims for understanding.

Traditional teaching methods in past centuries have often involved merely the transfer of knowledge, in which the teacher is the key actor and the goal is to memorise knowledge and repeat it later. The modern way of teaching no longer aims to “pour” knowledge into the student’s head, but instead, to provide the student with tools to learn and understand, to build new knowledge.

To facilitate learning, the learner must be motivated. All students attending a course are usually not equally motivated. Therefore, teachers should ask themselves why the students need to learn the topics dealt with during the course. If the students have no use for the knowledge, why bother? Most of us know how frustrating it is to be forced to memorise topic areas of courses.

Studying is efficient and results in good learning if students experience their studies as meaningful. Meaningful learning is described in Table 1.

References and additional information


<table>
<thead>
<tr>
<th>PRINCIPLE</th>
<th>APPLICATION, examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ACTIVITY</strong></td>
<td>Learning is based on the student's own activity.</td>
</tr>
<tr>
<td>How could I activate students to learn?</td>
<td></td>
</tr>
<tr>
<td>- Group work, assignments, etc. included in the course and its assessment</td>
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</tr>
<tr>
<td>- Pose activating questions, arrange discussions in small groups.</td>
<td></td>
</tr>
<tr>
<td><strong>INTENTIONALITY</strong></td>
<td>The student is aware of the learning outcomes and sets his/her own goals.</td>
</tr>
<tr>
<td>How could I encourage students towards goal-oriented studies?</td>
<td></td>
</tr>
<tr>
<td>- Make sure that the learning outcomes are defined in detail in the study guide. The description should be concrete enough for the students to compare their learning outcomes to the targets set, and assess their own knowledge accordingly. Knowledge acquired in courses is described in the form of learning outcomes (see Section 3.2.1). A course can be successfully completed by achieving the learning outcomes defined.</td>
<td></td>
</tr>
<tr>
<td>- At the beginning of the course, you should discuss and explicate the learning outcomes and give tips for studying, for planning one’s studies, for setting a schedule, etc.</td>
<td></td>
</tr>
<tr>
<td>- Extensive goals/outcomes should be divided into intermediate goals.</td>
<td></td>
</tr>
<tr>
<td><strong>CONSTRUCTIVISM</strong></td>
<td>Learning is based on prior learning and skills. Students can connect new knowledge with existing knowledge.</td>
</tr>
<tr>
<td>How could I support students when they build knowledge?</td>
<td></td>
</tr>
<tr>
<td>- Prior knowledge can be activated e.g. with an entry-level quiz or by revising the knowledge required for the course.</td>
<td></td>
</tr>
<tr>
<td>- A mind map helps to grasp the overall picture and how different topic areas are connected to each other.</td>
<td></td>
</tr>
<tr>
<td><strong>COLLABORATION AND INTERACTION</strong></td>
<td>Students work together and learn from each other, i.e. work in a knowledge-building community. Learning is interactive and conversational. Tacit knowledge is transferred best in social interaction.</td>
</tr>
<tr>
<td>How could I activate students to collaborate with each other in a way that supports learning?</td>
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<tr>
<td>- Small projects can be carried out in groups.</td>
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</tr>
<tr>
<td>- Assignments carried out in groups require good guidance and planning in order to ensure that all students participate and learn.</td>
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</tr>
<tr>
<td>- Teacher-student interaction can be strengthened through e.g. question hours and conversational lectures.</td>
<td></td>
</tr>
<tr>
<td><strong>CONTEXTUALISM</strong></td>
<td>Assignments are related to real life. They can be simulated cases or based on an authentic, existing problem.</td>
</tr>
<tr>
<td>What real-life situations or examples could I use in my teaching?</td>
<td></td>
</tr>
<tr>
<td>- Learning and assessment situations in the course should correspond to authentic situations from the world of work as much as possible.</td>
<td></td>
</tr>
<tr>
<td>- The teaching material should be authentic, topical, wide-ranging and realistic.</td>
<td></td>
</tr>
<tr>
<td><strong>REFLECTION</strong></td>
<td>Learners assess their own learning and reflect on their own conclusions.</td>
</tr>
<tr>
<td>How could I guide students to assess and reflect on their own studies and learning?</td>
<td></td>
</tr>
<tr>
<td>- The assessment criteria of the course should be clear and made known to the students.</td>
<td></td>
</tr>
<tr>
<td>- The course assessment and feedback on learning should be in line with the learning outcomes and instruction.</td>
<td></td>
</tr>
<tr>
<td>- Students are given feedback on their learning in different connections during the course. The feedback and assessment not only determine the students’ skill level, but help them to learn.</td>
<td></td>
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<tr>
<td>- Students are encouraged to reflect on what they have learned e.g. by keeping a learning journal.</td>
<td></td>
</tr>
<tr>
<td><strong>TRANSFERABILITY</strong></td>
<td>Learners can transfer what they have learned in a given situation into another situation or context.</td>
</tr>
<tr>
<td>How can I support the transfer of assimilated knowledge into different situations?</td>
<td></td>
</tr>
<tr>
<td>- Students are told how and when the contents of the course may be needed and utilised.</td>
<td></td>
</tr>
<tr>
<td>- Students are encouraged to consider and utilise the contents of the course also in other contexts.</td>
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</tbody>
</table>
2.3 Learning theories

People have a natural desire to learn and understand facts, phenomena, other people and themselves. People learn throughout their lives, consciously, in a goal-oriented way, and to a large extent also unconsciously and without effort.

Learning is also the cornerstone of the university institution: research, teaching and learning takes place in universities. Learning and sharing obtained knowledge is the very foundation of science and academia.

Learning has been studied scientifically since the 19th century with methods characteristic of each given period. Research has indicated that there is no one absolute truth to learning, but all learning theories are correct in their own way. They each open up different perspectives to the complicated learning process. People learn in many different ways, and learning is determined by e.g. age, context, targets set for learning, and the topic area taught. By finding out about the most important learning theories and approaches (see Table 2), teachers can reflect on and strengthen their own conception of teaching.

Table 2. Central learning theories.

<table>
<thead>
<tr>
<th>BEHAVIOURISM</th>
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</thead>
<tbody>
<tr>
<td><strong>Key principles</strong></td>
</tr>
<tr>
<td><strong>Application to teaching</strong></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>COGNITIVISM</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Key principles</strong></td>
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<tr>
<td><strong>Application to teaching</strong></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>EXPERIENTIAL LEARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Key principles</strong></td>
</tr>
</tbody>
</table>
**Application to teaching**

Adult education has traditionally entailed taking student experiences into account as a rich learning resource. In recent years, the importance of experiences in learning has been acknowledged more widely. As reflective and metacognitive skills develop, everyday experiences lead to new levels of abstraction. This allows to truly learn from experiences, and discussing them is no longer merely “entertainment” alongside actual studies. Learning environments that promote experiential, interactive learning include e.g. study groups and online discussion forums.

**CONSTRUCTIVISM**

**Key principles**

Constructivism is based on the concepts of the learner as an active modifier of knowledge, and the dynamic nature of knowledge. According to the constructivist approach, knowledge cannot be handed to the learner as such (cf. behaviourism). Instead, the learner constructs knowledge in a learning process. Constructivism is based on cognitive psychology (see cognitivism above). Constructivism is more a theory of knowledge than a learning theory because it focuses on analysing the origin of knowledge. According to constructivism, knowledge is created as a result of active construction by an individual, and it exists only through the learner.

The constructivist approach focuses on the internal learning processes of an individual. Therefore, it emphasises the individual nature of learning.

Learners formulate their own interpretations of information and create knowledge based on their prior knowledge and experiences. A person does not start with a clean slate, but handles and interprets new knowledge against a backdrop of previous experiences. Also physical and social factors have an impact on the knowledge created. Learning is also affected by the location and environment in which it takes place; learning is situation and culture dependent. In the world today, knowledge becomes outdated rapidly. Therefore, it is important that learning does not focus only on acquiring knowledge, but also on the complexity of the world and on how the learner could continuously learn something new. The constructivist approach to learning has led to education becoming more dynamic, individual and flexible.

**Application to teaching**

In constructivist education, the learner has a wide range of possibilities, but is also responsible for his or her own learning. Constructivist learning is learner-oriented. This learning theory has become more frequently applied, and the role of the teacher focuses more on guidance than the transfer of knowledge. According to the constructivist approach, teachers who plan their work look for answers to e.g. the following questions:

- What practical experience do students have in this topic area?
- To what prior knowledge can the content of the course be linked?
- How can everyone access this prior knowledge and competences?
- Does the teacher give all of the information, or could the students find out for themselves and teach each other?
- Do the students have sufficient support for independent study?
- Do the students need information on learning strategies they should use?

![Learning cycle](image)

**Figure 2.** Learning cycle. Learning is a continuous process, which is based on experiences and reflection on them. The process is a cycle because a successful learning process always produces new knowledge and new experiences through active experimentation, which again is reflected on.

**References and additional information**


Teaching is challenging, whether you teach technology, business or languages and communication. New knowledge is built on old knowledge, and the teacher must know what the student’s level is. Students must be able to experience their studies as meaningful, and the teacher plays an important role as the motivator. The teaching method chosen should be the one that best supports learning. The teacher should not consider any approach to teaching as a given. Instead, one should determine what kinds of teaching and assessment methods best support students in learning and achieving the learning outcomes.

Teacher of business
Business studies do not always have strict regularities. It is often more important to activate students to reflect on issues and discuss them. Business students must be able to understand expansive areas of information and find the key points in a vast amount of material taught.

Teacher of technology
Teaching is largely about relating facts: basic scientific phenomena remain the same. Learning subject areas of technology is often difficult and requires hard work. Therefore, it is difficult to anticipate the time needed to learn something. In addition, students often struggle at the beginning.

Language teacher
Extensive language and communication skills are an essential part of one’s competences. Practical exercises and work that focus on a wide range of aspects are the key elements. A variety of different methods that activate the learner are needed, such as role play.

2.4 Students learn in different ways
As do teachers, students also have their own conception of learning, and study methods and learning strategies have an effect on the learning outcome. Teachers are sure to encounter differences between students, and should therefore be aware of them.

“One year I received completely contradicting student feedback at the end of a course. One student said the course was organised well overall and that it suited him very well – a student used to independent study. Another said he needed clear instructions and boundaries and that he had trouble completing his assignments because the teacher did not define strict schedules. I think it was a question of the students being very different and having different learning styles and skills. It’s not easy trying to be a good teacher!”

2.4.1 Surface and deep learning
Students have their own strategies for learning. One way of categorising students’ learning strategies is the division into surface learning and deep learning, which are depicted in Table 3.

Surface learning may take place especially in compulsory courses. Teachers should always guide students towards deep learning. This is a very challenging task because the participants in a course typically include both surface and deep learners.

Students follow their own learning strategy.
2.4.2 Learners’ learning styles

Classifying the ways students assimilate information is one way to examine differences between students. One preferably studies alone, another prefers to listen, another likes to experiment in practice. The choice of teaching methods has an impact on how the knowledge is memorised, and a skilled teacher aims to take into account different ways of receiving and handling knowledge.

Table 4 presents different ways of handling knowledge and how they can be supported.

Table 3. Surface and deep learning strategies (Sulonen & Alanne 2000).

<table>
<thead>
<tr>
<th>Conception of knowledge</th>
<th>Surface learning</th>
<th>Deep learning</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Quantitative</td>
<td>Qualitative</td>
</tr>
<tr>
<td></td>
<td>• Memorising and repeating individual pieces of</td>
<td>• Deepening and focusing conceptions of reality</td>
</tr>
<tr>
<td></td>
<td>information</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Attitude to studies</th>
<th>Surface learning</th>
<th>Deep learning</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Passive</td>
<td>Active</td>
</tr>
<tr>
<td></td>
<td>• Focus on external factors and details in the</td>
<td>• Aims to understand the contents and create an</td>
</tr>
<tr>
<td></td>
<td>subject area</td>
<td>overall picture of the subject area</td>
</tr>
<tr>
<td></td>
<td>• Aims to repeat what is presented</td>
<td>• The student creates knowledge</td>
</tr>
<tr>
<td></td>
<td>• Low awareness of studying</td>
<td>• Criticism and high awareness of studying</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Learning outcome</th>
<th>Surface learning</th>
<th>Deep learning</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Knowledge of details</td>
<td>Understanding entities</td>
</tr>
<tr>
<td></td>
<td>• Easily forgotten, individual pieces of information</td>
<td>• Understanding the subject area and connecting it to a wider context</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Permanent ways of thinking that affect one’s activity</td>
</tr>
</tbody>
</table>

Table 4. Different ways of learning and how to support them.

<table>
<thead>
<tr>
<th>Active</th>
<th>vs.</th>
<th>Passive</th>
</tr>
</thead>
<tbody>
<tr>
<td>• learning by discussing</td>
<td></td>
<td>• thinking quietly</td>
</tr>
<tr>
<td>• application to practice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• teaching others</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Sensory</th>
<th>vs.</th>
<th>Intuitive</th>
</tr>
</thead>
<tbody>
<tr>
<td>• following clear</td>
<td></td>
<td>• learning without teacher direction and routines</td>
</tr>
<tr>
<td>instructions</td>
<td></td>
<td>• innovativeness</td>
</tr>
<tr>
<td>• acting based on facts</td>
<td></td>
<td>• application of abstractions</td>
</tr>
<tr>
<td>and practical knowledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• straightforward activity</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Sequential</th>
<th>vs.</th>
<th>Global</th>
</tr>
</thead>
<tbody>
<tr>
<td>• systematically and one</td>
<td></td>
<td>• learning large entities</td>
</tr>
<tr>
<td>step at a time</td>
<td></td>
<td>at a time “sporadically”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Independent</th>
<th>vs.</th>
<th>Controlled</th>
</tr>
</thead>
<tbody>
<tr>
<td>• planning one’s learning</td>
<td></td>
<td>• expects to be taught</td>
</tr>
<tr>
<td>independently</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• searching for information</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
One central factor in learning is the sensory channel we primarily use for learning. For some, one sense dominates, but most of us combine different senses in learning. You can find out your own learning style with a so-called VAK test (V=visual, A=auditive, K=kinaesthetic), which can be found e.g. in the publication by Marckwort & Marckwort (1992): “Kouluttajan uudet vaatteet” or on the Internet. Learning styles can be categorised according to the dominant sense, as in Figure 3.

![Figure 3. Learning styles based on senses.](image)

2.4.3. Learning disabilities

Some students have learning disabilities that e.g. make it difficult to learn, carry out assignments, complete exams, take part in group work or follow the teacher’s instructions. Such disabilities include e.g. dyslexia, mathematics and language disabilities, attention disorders, and auditory and visual processing disorders. If a student has a documented diagnosis for a learning disability, it can be taken into account in different learning situations.

In 2008, LUT had a committee for learning disabilities and especially dyslexia, which prepared the following recommendations.

**Dyslexia in the classroom - LUT’s guidelines**

**A. Guidelines concerning all students**
- The lighting in auditoriums should support studying as much as possible.
- The course material should be given in advance, if possible, e.g. through the internet.
- The course material is unambiguous and includes elements that help students to understand it, if possible. Such elements include a readable font, colours and structure.
- Instructions for assignments are detailed and accurate.
- A sufficient amount of time is set aside for studying the material.
- Students can choose from alternative methods of assessment.

**B. Guidelines concerning dyslexic students**

**Examinations**
- Students are entitled to take the examination in an area assigned to them alone and be given additional time for completing the examination.
- Students may complete the examination on a computer.
- Students may choose an examination method suitable for them, e.g. an oral test.
- Students are entitled to oral feedback on the examination.

**Assessment**
- Students are not given additional points due to dyslexia. Instead, the performance of the students is supported by other means specified in the university’s guidelines.
- The assessment focuses mainly on the quality of the knowledge and not on the language.
- In language courses, also the content is assessed, if possible.
- All assessment takes into account different compensation possibilities.

References and additional information


3 Preparation of the curriculum

3.1 Curriculum

The curriculum is one of the most important elements that regulates and directs teaching and studies. A functional curriculum makes the work of both teachers and students easier and sets a clear target for the work. A curriculum and a degree structure are often considered synonyms although they are completely different concepts.

An individual course is always part of a greater entity – a curriculum and degree structures. Also e.g. demands and needs stemming from society and the world of work play a role in the background. In addition, graduates share their views on the quality and development needs of the education they have received. The specialisation of the university and its units is also seen in their areas of emphasis in research and education. The education provided by the university is largely connected to the research areas of emphasis.

The vice-rector in charge of education heads the curriculum work in the entire university. The heads of degree programmes and study affairs are usually in a key position in this work, but coordinating professors lead the curriculum process in their disciplines in accordance with the policies defined by their unit.

Different units have different approaches to the coordination and execution of the curriculum process. The curriculum relates what kind of competences students develop in each degree programme or study module, and draws up different study paths to which courses are connected. A preceding course should give tools and knowledge required for the following, more advanced course. One should also analyse the interfaces between courses and take into account their connections. Each course has a coordinating instructor, who is responsible for the implementation, assessment and development of his or her own teaching.

Students profit from a carefully prepared, unambiguous curriculum which presents the main targets of the studies. It also helps teachers to use the resources for their teaching efficiently and productively, and better to understand the learning process and path in which an individual course is part of a larger entity that constructs the student’s competences. Study affairs administration provides tools for efficient study guidance and the preparation of individual study plans. The advantages of...
a functional curriculum lead to shorter graduation times, fewer students discontinuing their studies, and greater competences of students. The progress of the curriculum work is described in Figure 5. Individual teachers do not necessarily need to take part in each of its stages, but they should recognise and understand the importance of the stages in terms of the overall process and their own teaching.

3.2 Learning outcomes, contents and workload of a course

3.2.1 Learning outcomes

Learning outcomes relate to what students are expected to be able to do by the end of a course or a study module. For teachers planning their course, one of the main targets is to formulate and communicate the learning outcomes as clearly as possible. The learning outcomes should also be seamlessly connected to assessment because the assessment method is the most important factor directing the student’s activity and use of time. Carefully thought out and described learning outcomes support and guide not only the student’s studies but also planning by teachers and others taking part in the curriculum work.

Traditionally, courses have been planned from the teacher’s viewpoint, and objectives of the course have been described e.g. as follows: “The course deals with the basics of statistics” or “The aim of the course is to examine…” These sentences explain what the teacher will do. Sometimes the objectives have not been described at all, and the teacher has merely presented a list of concept that will be dealt with during the course. The teacher has simply chosen the contents, hours of work and assessment based on what he or she has intended to teach. According to current views, the teacher’s activity is not the most important element in learning. Most everyone currently agrees that the competences that students obtain from a course are more important than the teacher’s activity. Therefore, teachers defining and describing the aims of a course should focus on the student's learning outcomes instead of the teacher’s activity (see Table 5).

Preparing learning outcomes starts with listing the issues that each participant in the course should know after passing the course. Learning outcomes describe the minimum level required to pass the course. A good starting point for describing the learning outcomes is choosing the course contents carefully. In addition to the teacher’s views, also the study module (e.g. the major subject) and its requirements play a role in the choice. Core content

Table 5. Teaching aims and learning outcomes are not one and the same. The definition of learning outcomes is a key issue in setting targets.

<table>
<thead>
<tr>
<th>Teaching aim</th>
<th>Learning outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>A teaching aim is a teacher-oriented view of the education required</td>
<td>Learning outcomes clearly and unambiguously describe what students are expected</td>
</tr>
<tr>
<td>Contents-oriented</td>
<td>to know, understand or be able to do after the course or module</td>
</tr>
<tr>
<td>Traditional approach</td>
<td>Knowledge, skills and attitudes</td>
</tr>
<tr>
<td>A list of issues and concepts dealt with in the course</td>
<td>A good learning outcome also includes a verb that describes the level of</td>
</tr>
<tr>
<td>Examples: “The course includes…” “The course provides basic knowledge of…”</td>
<td>competence</td>
</tr>
<tr>
<td>“The course aims to examine…” “The course deals with the basics of science.”</td>
<td>Defines the key areas of competence (connection to the course contents and</td>
</tr>
<tr>
<td></td>
<td>and core contents)</td>
</tr>
<tr>
<td></td>
<td>The achievement of outcomes can be assessed, and outcomes direct student</td>
</tr>
<tr>
<td></td>
<td>assessment</td>
</tr>
<tr>
<td></td>
<td>Examples: “By the end of the course, students will be able to define…” “…be</td>
</tr>
<tr>
<td></td>
<td>able to design…” “…be able to compare and choose…” “…be able to identify the</td>
</tr>
<tr>
<td></td>
<td>most important…”</td>
</tr>
</tbody>
</table>
A good learning outcome includes a verb that describes what the learner is expected to be able to do by the end of the course. The verb describes the level of competence, i.e. whether simply memorising is enough or whether deeper knowledge is required. Since the learning outcomes must be achieved to obtain a passing grade, the achievement must be measured in some way. Therefore, the verb should not be abstract, such as understand, know, comprehend, etc., which are abstract. For example, instead of “understand the principles of”, the teacher could say “be able to explain the principles of”. To help classify the levels of competence, teachers may use target levels such as the frequently applied Bloom’s taxonomy of learning domains.

Carefully described learning outcomes help to plan the assessment methods for the course. The assessment methods also guide the student’s activity. New targets emerge for students if the assessment of learning and competences does not stem from the learning outcomes. One student may aim to complete as many courses as rapidly as possible. Another may be content with minimum performance in subjects that are not relevant to the student’s own purposes. In other words, choices guide our activity. Therefore, assessment methods should be chose based on the learning outcomes. If one of the learning outcomes is design skills, a traditional examination might not be the best way to assess the student’s competences.

Detailed and optimal learning outcomes
- tell students clearly what is expected of them
- help the teacher to focus on the essential
- guide work and assessment in the right direction
- support learning and promote cumulative learning
- give other teachers and stakeholders important information on the group or study module
- help students to examine their own overall competences.

3.2.2 Subject area:
How to define and delimit the essential?

A so-called core content analysis helps to delimit the contents of the course. It can serve to examine and specify the structure and hierarchy of the subject area. The contents of a course can be classified as 1) must know, 2) should know, and 3) nice to know; see Figure 6.

Revised Bloom’s taxonomy of competence levels:

1. **Remembering** - the ability to remember things in the form they have been presented: *list, identify, organise, describe, relate, define, find*…
2. **Understanding** - the ability to understand and interpret what one has learned: *categorise, explain, interpret, modify, separate, evaluate, summarise*…
3. **Applying** - the ability to use information in new situations and problem solving: *apply, use, calculate, construct, solve*…
4. **Analysing** - the ability to divide the problem into smaller parts and understand their connections: *analyse, choose, evaluate, compare, criticise, derive*…
5. **Evaluating** - the ability connect elements: *plan, design, develop, generalise, formulate, reorganise*…
6. **Creating** - the ability to create something unique and new, the ability to evaluate the value of ideas and solutions: *conclude, give grounds for, recommend, interpret, prove, choose and justify*…

![Figure 6](image-url)

Figure 6. The core content (1), should know (2) and nice to know (3) are mutually supporting elements of an entity.

**Must know** (core content) refers to knowledge and skills that are absolutely necessary in order to learn new knowledge and skills. The core content is not usually composed of individual facts, but rather theories, models and general principles. Most of the workload of the course is dedicated to its core content. The minimum aim is that all students learn and master the core content.
Should know includes the details and extensions to core content theories, models and principles. In other words, it contains knowledge and skills that may prove useful in some situations. High-quality, constructively aligned education does not, however, emphasise should know at the cost of the core content.

Nice to know supplements the core content and should know with details. It is rarely useful in learning the basics of some subject area. Acquiring nice to know knowledge is largely up to the student. In instruction, nice to know usually merits a passing mention, and students are not required to learn it.

ASSIGNMENT: Apply the core content analysis to the contents of your own course or degree programme by e.g. filling out the table below.

<table>
<thead>
<tr>
<th>What should the student know?</th>
<th>1. MUST KNOW</th>
<th>2. SHOULD KNOW</th>
<th>3. NICE TO KNOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scientific competence (What does the student know in theory?)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professional competence and skills (What does the student know in practice?)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3.2.3 Credits and workload

Defining the workload of the course aims to ensure that students are provided a sufficient and realistic amount of time to learn at least the key learning outcomes. On the other hand, it aims to ensure that the workload at an annual level is reasonable and that the course fits the two-cycle degree structure.

In the recent degree reform, the workload measurement for courses was changed from credit-based to hourly-based. The ECTS credit was, in connection of the Bologna Process, adopted as the standard for workload measurement for studies within the European Union. A total of 60 ECTS credits correspond to the work carried out by a student during one academic year, i.e. 1600 hours of work. Therefore, one ECTS credit amounts to 26.7 hours of work. A decree has been issued on the overall extent and time of completion for degrees. The calculated time of completion for a Master’s degree is five years, and its workload 300 ECTS credits, consisting of Bachelor’s studies worth 180 ECTS credits and Master’s studies worth 120 ECTS credits.

The transition from the previous degree system to the ECTS system was not problem-free, and the workloads at the beginning of their career, teachers often resort to book learning because of their own limited experiences. It may be difficult to fill the time reserved for the class. Later, as the teacher accumulates experiences, the problem may be the opposite: there is not enough time for what the teacher wishes to communicate. The excess of time should be utilised e.g. by activating students in the classroom. Also the teacher can learn in such learning situations, given the right attitude.
You should take at least the following points into account in planning the contents of a course or module:

1. You are the expert in the content area that you teach; students are experts in their own way of learning.
2. Approach the content area you teach from the student’s point of view and think about how to present it in an easily digestible way. Take into account the student perspective and the learning outcomes defined.
3. Teachers teach in order to help students learn. Students themselves are responsible for learning the subject area.
4. Learning takes time. The subject area, time and learning are interrelated. An overloaded course content makes students focus on surface instead of deep learning. Concentrate on the essential!
5. The assessment method chosen for the course is the most important factor directing the student’s activity and deep learning. Choose the best possible assessment method for the course and think about alternative modes of examination and assessment.
6. Students learn only part of what is written in the curriculum, which, in turn, is only part of what is taught during courses. On the other hand, students also learn elements that are not included in either. See Figure 7.

Figure 7. Dimensions of the curriculum. (Adapted from A. Karjalainen (ed.) 2003: Akateeminen opetussuunnitelmatyö, p. 29.)

7. Make sure that the workload for the course is defined accurately: 1 ECTS credit = 26.7 hours of work by the student – no more, no less.
3.3 Planning the implementation of a course

Planning a course is based on the above-mentioned choices regarding the contents and learning outcomes. In addition, teachers should answer the following key questions:

- Who is taught?
- How should they be taught?
- What teaching material will be used?
- How are student competences assessed?

There are many ways to implement a course. One should bear in mind that teaching does not directly lead to learning. Learning is a result of the student's own work. Good teaching guides and helps the student to work intensively on the issues taught. The assessment of and feedback on learning should support learning appropriately.

3.3.1 Who is taught?

All teaching must be planned according to the target group, i.e. the students taking part in the course. Students in different courses have different knowledge and skills, and for example the ability to study and learn independently varies depending on the student's previous experience, education, work, motivation and learning style and study methods.

A 19-year-old straight from upper secondary school is accustomed to teacher-oriented studies and is not necessarily a very independent learner. When the student learns academic study procedures, the capacity for independent study also develops. International students are a group of their own: they have usually completed some studies in their field, and their study methods depend largely on the culture from which they come. Mature students are a heterogeneous and demanding group with a variety of backgrounds and expectations. Figure 8 shows the presumable capacity of different student groups for independent study.

3.3.2 How to teach them?

A course can be carried out in countless ways, and each teacher plans and implements courses – even the same ones – in their own way according to their own pedagogical choices. Teachers bring their own personal touch and their own areas of strength to a teaching situation. One of our university's goals is that a course should be implemented expediently. Here, expedient refers to at least the following points:

- The implementation of the course suits the target group and takes its special features into consideration.
- The implementation of the course ensures that the learning outcomes of the course can be achieved and supports their achievement in the best possible way.

A teacher planning a course decides what students should do to achieve the competences described in the learning outcomes.
Figures 9 and 10 depict two different ways of implementing a course.

**Figure 9.** Teacher-oriented teaching. In the teacher-oriented approach, the teacher plans the lectures and goes through the contents of the course. Students’ competences are assessed with a traditional examination, which often leads to surface learning.

**Figure 10.** Teaching that activates students. Activating students to work on the subject area throughout the course better ensures the continuous accrual of competences and deep learning. Continuous assessment may replace the traditional examination. Criticism and feedback motivate the student and support learning.

Teaching means guiding students to learn. When teachers choose teaching and working methods for their courses, they should think about how the issues could best be learnt. For example, the following points affect the choice of teaching methods:

- The nature of the course and subject area taught (Is it a basic or advanced course? What is the subject area like? Does it emphasise knowledge or skills?)
- Contact vs. distance teaching (Is distance teaching necessary e.g. because of students with employment?)
- The number of students (Is it a mass course or a small group?)
- Teaching resources (How much time is spent on teaching? Who are the teachers?)

Does your course include assignments that could replace the exam as the method of assessment?
Table 6 demonstrates some teaching methods. By combining and applying them, teachers can inspire students and motivate themselves.

### Table 6. Teaching methods.

<table>
<thead>
<tr>
<th>Method</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lecture</strong></td>
<td>The lecturer speaks and students listen. Lectures enable questions and answers without delay. A suitable alternative when the same points must be told to many students.</td>
</tr>
<tr>
<td><strong>Activating lecture</strong></td>
<td>Students are activated to learn — not only to be physically present. In addition to the lecturer, also students get to talk. They are given e.g. topics to discuss in groups or small assignments related to the lecture (e.g. taking a vote or a quiz).</td>
</tr>
<tr>
<td><strong>Tutorial</strong></td>
<td>Students practice carrying out assignments in a supervised environment: e.g. discussing solutions to assignments with the instructor, carrying out assignments under the supervision of the instructor, or reviewing homework assignments. Students may be assigned homework.</td>
</tr>
<tr>
<td></td>
<td>Figure 11 shows how the student’s independent work and the teacher’s role vary depending on the type of tutorial.</td>
</tr>
<tr>
<td><strong>Online instruction</strong></td>
<td>Online instruction provides students and teachers the possibility to carry out their work irrespective of place and time. Interaction (e.g. writing in newsgroups) is often not simultaneous. Online instruction requires independence on the part of the student, and good planning, instructions and guidance from the teacher.</td>
</tr>
<tr>
<td></td>
<td>See page 24 for further information on online instruction.</td>
</tr>
<tr>
<td><strong>Case exercises or seminar projects</strong></td>
<td>The nature of case exercises may vary: they may be extensive or small, carried out at the university or in cooperation with a company, alone or in groups, which enhances group work skills. They usually examine cases. Case studies connect theories to the real world. A case can be a small detail in the course, or the entire course may be dedicated to a single case.</td>
</tr>
<tr>
<td></td>
<td>Students may be allowed to form their own project groups, or they may be assigned to one. One alternative is to apply a project organisation to the group, in which each member has a specific role. This approach works best when the same group performs a number of tasks, allowing the students to rotate the roles. This develops project work and supervisor skills.</td>
</tr>
<tr>
<td></td>
<td>The results of the case exercises may be discussed in: - a seminar (the author(s) present their work to the others; in large groups everyone might not have a chance to present their work — only an individual successful project) - a walk-through (each student presents the work of his or her team to a small group composed of members of other teams).</td>
</tr>
</tbody>
</table>
Learning assignments may be completed outside contact lessons independently or in groups. The teacher sets a deadline, supervises the work and gives feedback in the end.

Students may, for example, solve a problem of their choice in a group under the supervision of the instructor. The process has many stages and includes independent study during which the group searches for information needed to solve the problem. Each group member has a role (chairman, secretary, observer), which may be rotated in different sessions (so-called problem-based learning).

Excursion
A study-related field trip to e.g. a company in the field. Students usually find excursions interesting because they help to connect theory with reality. The date and time and guided tour of the company should be set well in advance. The teacher should also find out about transportation and who pays for it, if e.g. a bus is hired for the group.

Learning games
Learning games can be played in a classroom or online, individually or in a group. The games are often used as an addition to other teaching methods for instance to practice applying what has been learnt. On the other hand, an entire course may be dedicated to a learning game.

Educational drama
Educational drama refers to different free-form learning situations that involve acting, a storyline and games. Students may play different characters, such as experts in a product development group, a CEO, a purchaser and a lawyer. The students may play the character throughout the course or in specific contact teaching situations. The aim is for students to find solutions through their own activity. Discussion and feedback are important elements of this method. Educational drama may also be used to develop the learner’s professional interaction skills.

Assignment: List five ways to activate students in your lectures to analyse, handle, evaluate and question – i.e. learn – the subject area of the lecture.

Figure 11. Teachers should make themselves redundant. The figure shows how to rise from the foot of the tree to the top e.g. in supervising tutorials. The top describes problem-based learning.
3.3.3 What teaching material will be used?

Teaching material aims to support studies and learning at different stages of the course. Planning the material is closely connected to planning the subject area taught and the implementation of the course. When teachers plan their teaching material, they should think about what type of material is needed to support the teaching methods chosen. Good material illustrates and provides new dimensions to instruction and encourages its user to think independently.

The teaching material may be prepared by the teacher (e.g. a hand-out, assignments) or someone else (e.g. books, articles). Students may also produce part of the material (e.g. seminar presentations, summaries of articles). It is important to observe copyright legislation in the use of material produced by others.

Both the quality and quantity of the material should be considered in the planning stage.

Quantity of material
There might be vast amounts of suitable material available for use, but teachers should keep in mind that a large amount of teaching material does not guarantee successful learning, and an excess of material may even hinder the learning process. Therefore, it is important to introduce the essential contents of the course as clearly as possible, and explain the role of the material in relation to the other instruction. If many different sources and materials are used, it might be useful to provide students with a summary of the key points of all of the material. This would help students to determine what they need to learn.

Quality of material
High-quality teaching material e.g.

- is available: It is important to remember that the availability of many textbooks in libraries is limited. In addition, students are not always able to take part in all lectures or tutorials. Therefore, the material should be made available to all participants in the course e.g. through the Internet.
- suits the target group
- fits the learning outcomes of the course
- supports learning: Good teaching material guides, motivates and activates students to study and learn, and fosters meaningful learning (see Section 2.2).
- has a relevant content for the target group and the learning outcomes

Table 7 presents different types of teaching material and points that need to be taken into account.

References and additional information


Table 7. Different types of teaching material and points that need to be considered in their use.

<table>
<thead>
<tr>
<th>Material Type</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Books</td>
<td>Entire books or parts of them may be used as teaching material. The availability of the book in the library should be ascertained. Books may also provide additional information to those interested. Note! If the book is not available at the university library, a purchase proposal may be made.</td>
</tr>
<tr>
<td>Articles</td>
<td>The availability of the article should be determined: can it be photocopied or distributed in electronic form?</td>
</tr>
<tr>
<td>PowerPoint slides</td>
<td>The purpose of the material is to support the teacher’s oral presentation. If students have to spend the lecture writing down the information on the slides, they have no time to listen to the teacher. Giving students the background material (PP slides as handouts) in advance makes learning more efficient.</td>
</tr>
<tr>
<td>Slides as handouts</td>
<td>Supports the lectures but do not work independently. The slides should contain only the main points of the lectures; writing something down once in a while instead of just listening may be refreshing for the students.</td>
</tr>
<tr>
<td>Handouts</td>
<td>Written material compiled by the lecturer.</td>
</tr>
<tr>
<td>Other written material</td>
<td>For example pamphlets that provide additional information to those interested.</td>
</tr>
<tr>
<td>Videos</td>
<td>Video clips may introduce a process in practice if a demonstration is not possible. The video may be shown during the lecture or distributed over the Internet. A movie dealing with the topic of the lecture may stimulate conversation.</td>
</tr>
<tr>
<td>Demonstrations (e.g. authentic tools)</td>
<td>Presenting an issue or phenomenon in practice may help to understand the issue at a practical level. Demonstrations also bring variety to lectures.</td>
</tr>
<tr>
<td>Web sites</td>
<td>For example, many associations and ministries post useful and up-to-date information on their web sites.</td>
</tr>
<tr>
<td>Online teaching material</td>
<td>Teachers who compose online teaching material should take into consideration both its pedagogical contents and its technical aspects. The contents may be additional material for the course or even an independent course of its own. The material should allow the student to learn effortlessly and efficiently about the subject area taught. Compared to other teaching material, online material has special features that need to be taken into account, such as independent use, functionality and accessibility. Online material of high pedagogical quality presents relevant material in a way that supports learning, and relates unambiguously e.g. the nature and learning outcomes of the studies. Functional material guides the user to work correctly and enables efficient study and learning. Further information on creating online teaching material and a tool for assessing your material are available on the Finnish Virtual University web site.</td>
</tr>
<tr>
<td>Exercises and supporting instructions</td>
<td>Exercises may be distributed to students in contact lessons or online. Students need feedback on their performance. Simply copying answers from a source leads to superficial learning which is easily forgotten.</td>
</tr>
</tbody>
</table>
Additional information on online instruction

There have always been high hopes for the educational use of new technologies, for example the radio, television and personal computer. However, no technology has been able to fulfil these expectations. One reason may be that the focus has been on the technology itself: the medium has been expected to improve learning results, but too little attention has been paid to how people actually learn.

What is educational technology? How does it relate to teaching methods?

Educational technology may, above all, be considered as a tool that makes studies easier and more flexible. At best, teachers can concentrate on actual teaching instead of administrative routines, and students have more time for studying. A primitive example of educational technology is the blackboard: it allows the teacher to illustrate what he or she has explained to students. The next step could be the overhead projector. A leap towards more sophisticated educational technology is the computer, which allows teachers to write and save things in an easily modified form, and through an online learning environment transfer the material to students who can study the material at a time convenient for them.

Regardless of the development of educational technology, learning has not necessarily improved – educational technology has merely slightly facilitated studies. Learning is still the student’s own responsibility, and the sensible use of educational technology must be planned by the teacher: Should the teacher arrange an online lecture so that students do not need to travel long distances to attend a lecture at the university? Should the teacher prepare an animation that helps students to understand a difficult and abstract technical phenomenon? Should the teacher provide a tool that allows students at long distances from each other to work as a group?

Educational technology may, therefore, enable students to understand and learn better – similarly to traditional contact teaching. It is only a question of how skilfully the teacher uses educational technology in his or her instruction.

The use of technology to help studies and learning is a natural, everyday part of the modern student’s life. For example, online instruction is a modern phenomenon that has been embraced by LUT instructors. Based on feedback given by LUT students, the key elements of online instruction are flexible studies, easy accessibility to teaching material, up-to-date instruction, efficient communication, study guidance and controlling that studies progress. Students value new types of teaching material and tools that facilitate learning. Online instruction can e.g. expand the physical boundaries of an educational institution – different distance learning and adult education programmes have been built on this fact at LUT. The increasing number of non-conventional, working students, internationalisation and student mobility require solutions that make studies more flexible. Carefully planned use of educational technology can respond to this need.

LUT provides the following support in educational technologies and online instruction:

- Help in the planning and implementation of online instruction, and technical and educational support in the use of the Blackboard learning environment.
- Help in the use of the exam aquarium. There is an exam aquarium in Origo, in which students may take exams at a time convenient for them. This provides flexibility to their studies. Exams are created with the exam aquarium application software. The educational technology team offers support in the use of the aquarium, practical solutions and the preparation of examinations.
- The multimedia workshop and studio are located in room 7541. The facility consists of equipment for producing, processing and publishing video material. Origo lends out equipment such as laptop computers and devices for recording audiovisual material and data.
- In addition, LUT has adopted the Noppa portal, which contains information on the university’s courses.

Further information
www.lut.fi ➔ Studies ➔ Learning Centre
3.3.4 How are student competences assessed?

During or after the course, the teacher assesses how well the students have achieved the learning outcomes set for the course. Assessment is an essential quality assurance measure in university education, although its most important aim is to support students’ learning. The grounds for assessment should be determined carefully in advance and described as unambiguously as possible e.g. in the form of the assessment matrix below.

In planning the assessment for a course, the teacher should take into account that the assessment method has a STRONG effect on how the student studies and learns. If the assessment is based solely on a conventional examination, students might not attend lectures. Everyone aims to optimise their use of time, and many consider it a waste of time to attend lectures and tutorials if attendance has no effect on the grade. Nevertheless, the student’s learning style also has an impact on the choices made by the student.

Assessment may be based on a traditional examination or different variations of it (e.g. home examination), continuous assessment, learning assignments and many other assessment methods. What is important is that the assessment method is aligned with the learning outcomes and teaching methods. The annex to this manual provides a summary of assessment methods for different purposes.

Assessment matrix as a tool for teachers

Students usually prepare written assignments on different topics. The fair assessment of such cases is difficult because e.g. some topics are easier than others. Therefore, an assessment matrix is a useful tool for teachers. It also guides students in their studies. If the assessment matrix or other assessment criteria are given to students in advance, students can focus on the right aspects already as they prepare their assignments.

Below is an example of an assessment matrix, which describes the assessment of seminar projects, seminar presentations and opponents’ work.

Table 8. Example of an assessment matrix.

<table>
<thead>
<tr>
<th></th>
<th>Insufficient level</th>
<th>Sufficient level</th>
<th>Good level</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Layout/general</strong></td>
<td>Too short, does not follow instructions on form or structure, many spelling and grammatical errors.</td>
<td>Follows instructions, now sections incomplete or missing, work divided into more than one part.</td>
<td>References to figures, tables and annexes, logical organisation, conclusions, writing concise, not too wordy.</td>
</tr>
<tr>
<td><strong>Contents</strong></td>
<td>Only the course textbook used as reference material, passages copied directly (translated), does not correspond to the title of the work.</td>
<td>Two sources combined, quotations of moderate length, references accurate, reasonable delimitation of topic.</td>
<td>Only short quotes, information combined from different sources.</td>
</tr>
<tr>
<td><strong>Sources</strong></td>
<td>No sources listed, no references, plagiarism.</td>
<td>Some sources, references.</td>
<td>Many sources listed: books and articles.</td>
</tr>
<tr>
<td><strong>Presentation</strong></td>
<td>Read straight from the paper, slides confusing, carelessly prepared.</td>
<td>Paper used as support, slides coherent and carefully prepared, presentation coherent.</td>
<td>Well organised, logical presentation with examples and visual aids.</td>
</tr>
<tr>
<td><strong>Opponent’s work</strong></td>
<td>Focuses on punctuation and other errors of secondary importance, vague and non-specific.</td>
<td>Prepared in advance, all areas of the opponent’s work covered.</td>
<td>Development proposals and the opponent’s own points of view.</td>
</tr>
</tbody>
</table>

Table 8. Example of an assessment matrix.
LUT guidelines for assessment

Each teacher should be aware that LUT has certain guidelines for the assessment of student competences. Detailed instructions have been prepared for e.g.

- the assessment scale
- the assessment schedule
- the student’s right to request a correction to their assessment
- disciplinary measures (www.lut.fi ➔ Opiskelu ➔ Ohjeet ja lomatkeet ➔ Ohjeet ➔ Toimenpideohjeet vilppitapauksissa)

The instructions can be found on the university intranet in Finnish: Tietopankki ➔ Opintoasiat ➔ Opintotoimisto.

References and additional information


3.4 Putting the plan into action – practical aspects

It is a pleasure to implement a well-planned course. Students are taught and guided according to the plan, issues are communicated as needed, and student competences are assessed. Nevertheless, teachers should bear in mind that it is not possible to plan and anticipate everything.

Did you know this about group dynamics?

Differences between students and participants can be taken into consideration, as described in Section 2.4, but each group has its unique dynamics that brings its own flavour to the teacher’s work.

Group dynamics is a question of morals, atmosphere, influence, participation, leadership struggles, conflicts, competition, collaboration, etc. Usually, too little attention is paid to group dynamics even though it is the main reason for inefficient group activity.

Already two people form a group. In other words, we are part of a group from the minute we are born, and we learn to function as a member of that group. In education, small groups of 3-15 people make learning more efficient, teach cooperation skills and offer possibilities for personal development. In addition, the modern world of work requires team work skills. In this context, small groups refer to groups that meet regularly over a long period of time (e.g. a semester) under the supervision of a teacher. Group work often refers to assignments that students independently divide among themselves. Everyone does their share and no interaction between team members takes place. The interaction within the group, however, is a resource that should be tapped.

Small groups cannot be applied to all forms of teaching, but each learner should also learn to work in a group. Especially solving problems and research projects, which are applied to problem-based and collaborative learning, are suitable forms of work for small groups. Authentic group work and using it to its full potential requires extensive study, and it can be learnt only through experience. However, understanding group dynamics is a good start.

Regardless of their size and how long they work together, all groups go through the same development stages. There are different types of categories, but the basic idea is that initial confusion leads to conflicts, and finally to cohesion. A cohesive group has gone through all of the following development stages:

1. Forming (finding acceptance, general anxiety, searching for group norms)
2. Storming (power struggles, sub-groups, conflicts)
3. Norming (team spirit)
4. Performing (roles and leadership assigned, focus on task)
5. Adjourning (dealing with remaining issues, feedback)
Arrange guidance and communication!

- At the beginning of the course, give students as detailed a schedule as possible.
- Agree on the communication forum for course related issues.
- Set an office hour during which you can focus on guiding the students.
- If some students easily master the subject area, have them assist in teaching – teaching others poses a challenge even to good students.

References and additional information


3.5 Assessing the implementation of a course

How did I succeed in teaching the course? What do the students think and what development suggestions could they have? These questions can partly be answered by examining the learning outcomes of the students, but they do not tell the entire story. Therefore, it is important to collect feedback from students.

Student feedback

LUT has adopted the Webropol feedback systems, and the university has set guidelines for the collection of student feedback on courses. Feedback is collected uniformly in order to obtain comparable information on the quality of education at our university. This means that students are asked to evaluate all courses according to the same criteria. The same questions are posed in all course feedback forms. Students assess the following points:

- implementation of the course
- overall assessment of the course (scale of 1-5)
- open feedback on the course.

This university-wide procedure does not prevent teachers and units from using the query tool for other purposes, e.g. assessing the entry level of students, interim assessments of the course, etc. In fact, this is recommended since it provides valuable feedback based on which the course can be developed. Teachers are free to decide what else they wish to ask students about the course. Teachers may formulate questions based on their own aims for the feedback. Adding questions to the feedback template has been observed to increase the response rate considerably.

At times, teachers may receive extremely negative feedback from students, which is naturally displeasing to the teacher. It is, however, important to consider the reasons for that feedback and to try to learn from it. Why did the course not meet the students' needs or expectations? Was it a question of content, implementation, or an inaccurate assessment of the students' level and needs (too easy or difficult)?

You can prepare your feedback form with the help of the Webropol administrator in your unit. The contact information is available on the intranet: Työvälineet ➤ Webropol-palautejärjestelmä ➤ Yhteystiedot.

Response to student feedback

To motivate students to give feedback, it is important for teachers to respond to the feedback. The response tells students how their feedback is processed and what kind of an impact it has.

The teacher's response is an important part of the feedback process. Teachers learn about their own instruction as they send students the response, and only then truly analyse the feedback they have received. If the feedback is not properly analysed and processed, the feedback system has little value. Student feedback and the teacher's response to it are tools for developing teaching, and help to take practical development measures.

Teachers respond to student feedback by relating what kind of feedback the course received, how the teacher intends to utilise it, and what conclusions can be drawn from it. Teachers may also give feedback to the students on the part they played in the success of the course and tell them about the teaching experience.

The response is made available to the students e.g. by e-mail, through the internet or on the bulletin board. Students should be told e.g. in the feedback form how they can access the response. Teachers may also arrange a separate feedback session in which the feedback is discussed. During the session, the teacher may also give feedback on examinations and case exercises; give the correct results and assessment criteria.
Reporting student feedback

High-quality education is an important strategic goal for our university. The management of the university and units need documented information on the level of education for quality assurance purposes. Therefore, everyone who prepares Webropol feedback questionnaires must report to the management of their unit and the university on the feedback they have collected. This allows the university to focus development measures where they are needed.

Feedback reports are compiled by the Webropol administrators of each unit: they collect information from teachers on course feedback regarding the university-wide questions, and on the teachers’ response to feedback. Open feedback is for the teachers’ use only.

3.6 Continuous development of courses

A key stage in the teacher’s self-assessment is to collect and analyse feedback carefully and draw the necessary conclusions for the following course. Development needs may be derived from several sources:

1. Students’ learning outcomes: how have students achieved the learning outcomes set for the course?
2. Student feedback.
3. The teacher’s own experiences and observations during the course – self-assessment of the teacher.
4. Developments in research and legislation.

Teachers should record the analysis of their feedback in e.g. their own teaching journal, in which they may also write comments and ideas that have emerged during the course. Thus the teaching journal acts as a development tool in the teacher’s work.

Lappeenranta University of Technology requires a teaching portfolio of applicants to teaching positions. The portfolio includes information on the applicant’s teaching background, teaching philosophy, feedback and professional development. Teachers should start compiling the portfolio already at the beginning of their career. Further information is available on the intranet:

LUTnet ➔ Tietopankki ➔ Henkilöstö ➔ Henkilöstön kehittäminen ➔ Yliopistopedagoginen koulutus.

LUT also regularly organises training in university pedagogy, which aims to strengthen the practical teaching competences of the teaching staff. Further information on the intranet:

LUTnet ➔ Tietopankki ➔ Henkilöstö ➔ Henkilöstön kehittäminen ➔ Yliopistopedagoginen koulutus.

At the beginning of their career, teachers are naturally unsure of themselves because their competence and experience does not necessarily exceed that of their students by much. Mature students with an extensive background in the world of work may know much more. Students’ experience is a source worth drawing from, but it should not dominate the situation. Presenting the topics convincingly and assertively may compensate for one’s insecurity. All teachers are posed questions which they cannot answer directly. Do not act as if you know it all — tell the students that you will find out more for the next class. It is also important to keep that promise.
4 Good teaching in a nutshell

A. Before the course

FIND OUT THE POSITION OF THE COURSE IN THE CURRICULUM
- What courses do the students take before and after your course?

DEFINE THE LEARNING OUTCOMES
- Why is the course taught?
- What should the student know by the end of the course?
- What is the core content, what is information they should know and what is nice to know?
- What is the workload of the course?

PLAN THE IMPLEMENTATION
- Who is taught?
- How are they taught?
  - learning situations and teaching methods
  - schedules
  - rules
  - communication
- Who teaches? (Book possible visiting lecturers in time.)
- What teaching material is used?
- When and how is the possible material distributed to students?
- How are student competences assessed?

FIND OUT IN ADVANCE
- The students’ entry level at the beginning of the course e.g. with a quiz or a short essay.
- Whether the teaching facilities are suitable and the equipment functions.

B. During the course

MOTIVATE YOURSELF AND YOUR STUDENTS
- …because a motivated person is not bothered by minor shortcomings.

MAKE THE RULES CLEAR
- Let the students know the rules, the grounds for them and what happens if they are not followed: e.g. behaviour in class, observing deadlines, copying someone else’s work, etc. The same rules apply to everyone!
- Be a good example: if you expect students to be on time, do not be tardy yourself.

INTERACT WITH YOUR STUDENTS
- Come out from behind the teacher’s desk and be approachable. Be there for the students and offer instruction when it is needed.
- Accept all questions. If you do not know the answer, you can promise to find it out for the next time. Keep your promise!
- Monitor the students’ learning and address possible problems and issues that require clarification and additional instruction. Also pay attention to more advanced students.

KEEP A TEACHING DIARY
- After a teaching situation, write down what worked, what did not, and new ideas. Use the diary to develop your teaching.

BE YOURSELF
- You give the best lessons by being true to yourself.

C. After the course

ASSESS
- How were the learning outcomes achieved?
- What was good?
- What could be improved?
- Other ideas and experiences?

COLLECT FEEDBACK
- From students.
- From teachers whose courses have yours as a prerequisite.

RESPOND TO FEEDBACK OR HOLD A FEEDBACK SESSION
- Tell the students the assessment criteria and possibly also the correct answers after the examination.
- Talk to the students after the course. This allows giving and receiving feedback mutually.

DEVELOP YOUR COURSE AND YOURSELF
- Put development proposals to practice.
- Search for new ideas from colleagues, students or courses, take part in university pedagogy training, education seminars…
- Update your knowledge of the subject you teach.
- Compile a teaching portfolio and update it.
### Written examination

Suitable for many types of courses, especially mass courses with lectures. The exam may include questions in line with the nature of the course, which students answer briefly, essays, equations, filling in missing words (languages). The exam may also have multiple-choice questions (true/false), for which students may be required to give grounds. Exams may also have alternative questions from which students may choose.

### Oral test

Students are interviewed on the topic of the course.

### Group examination

A group exam has different variations. It may include a simple preliminary test, which ensures that students have roughly the required level of knowledge. Those who pass the preliminary test make it to the following stage. A group assigned in advance prepares for the exam as they choose. The group examination may include questions similar to a conventional exam, but the answers are discussed and prepared as a group. The group may also choose from a number of alternative questions. Usually the teacher grades the response immediately and gives feedback to the group. Each student in the group receives the same grade.

### Literature examination

Students may bring e.g. lecture material and textbooks to a literature examination. The material may be used as support or to provoke ideas, but students should study it beforehand in order to use it to its full advantage in the exam. The questions are usually extensive and require analysis. The answers cannot be found directly from the literature in the examination. Instead, students must be able to connect and apply the information.

### Entry-level test

Before the course starts, students may take an entry-level test, which may also as an admission criterion for the course. The actual course may then focus on areas that are difficult for the students.

### Continuous assessment

Smaller assignments, tests, and exercises are assessed throughout the course.

### Case exercises and seminar projects

The teacher gives a sufficiently extensive assignment, clear assessment criteria and a schedule. The assignment may be the same or different for each group. The size of the group may be one student or more. The teacher may distribute the required material, or the students search for material independently from different sources. The project may determine the entire grade or part of it.

### Written reports on laboratory or design assignments

When an individual student or a group completes an assignment in the laboratory, the student prepares a written report on what has been done and the results obtained.

### Essays

Student write a concise text on a topic assigned to them.
It is often possible to determine a fair way to grade the answers. The exams can easily be graded one question type at a time. When the exam is the same for everyone, a feedback session can be arranged afterwards, dealing with the correct answers and assessment criteria. Publishing the grades for the first time in the session will motivate students to attend.

An oral examination is an efficient way to assess whether the student has truly understood the content area of the course. Students may be posed additional questions, if further clarification is needed.

A group examination is an effective way to assess whether the students have truly understood the content area of the course. Students may be posed additional questions, if further clarification is needed. Saves the examiner’s time compared to an individual oral test.

A true indicator of whether the student has understood and can apply the knowledge. Memorising the course and exam material does not suffice.

Makes teaching more efficient e.g. by decreasing the amount of contact teaching and increasing students’ entry-level knowledge of the topic area taught. Also serves as an indicator of students’ competence level before the course.

The teacher and students obtain information of the students’ competences well in advance, not only after the course has ended. Thus the teacher may modify his or her instruction or emphasise different issues as needed. Motivates students to take part in contact teaching and focus on learning throughout the course.

Gives students an opportunity to learn by doing.

Learning by doing and subsequent analysis; what happened, why it happened, etc. With appropriate instruction, also develops students’ scientific writing skills.

Writing an essay teaches students to organise their texts coherently and to examine issues from different perspectives.

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<table>
<thead>
<tr>
<th>ADVANTAGES</th>
<th>COMMENTS</th>
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<tbody>
<tr>
<td>It is often possible to determine a fair way to grade the answers. The exams can easily be graded one question type at a time. When the exam is the same for everyone, a feedback session can be arranged afterwards, dealing with the correct answers and assessment criteria. Publishing the grades for the first time in the session will motivate students to attend.</td>
<td>Special attention should be paid to the preparation of the questions so that students do not merely memorise the topic area but will strive for deeper understanding (e.g. applying a theory to an environment familiar to the student). The exam does not provide tools for the future because few professional situations involve solving problems in a closed space with no material or communication channels for a limited period of time.</td>
</tr>
<tr>
<td>An oral examination is an efficient way to assess whether the student has truly understood the content area of the course. Students may be posed additional questions, if further clarification is needed.</td>
<td>This method means a great deal of work for the teacher especially in courses with many students. The teacher may need to prepare different questions for all students because they take the exam at different times. The exam situation may be more stressful than a written exam for both the teacher and the student.</td>
</tr>
<tr>
<td>A group examination is an effective way to assess whether the students have truly understood the content area of the course. Students may be posed additional questions, if further clarification is needed. Saves the examiner’s time compared to an individual oral test.</td>
<td>It is important to define the ground rules for the group exam. All students must observe these rules. The teacher should also find some way of ensuring that no group member receives a good grade solely based on the merits and work of others.</td>
</tr>
<tr>
<td>A true indicator of whether the student has understood and can apply the knowledge. Memorising the course and exam material does not suffice.</td>
<td>A literature exam is challenging for students because they need to master the contents of the literature in order to succeed in the examination. Students should be guided so that they do not get the wrong impression of the level of difficulty of the exam. The questions should focus on the application of information, not its repetition.</td>
</tr>
<tr>
<td>Makes teaching more efficient e.g. by decreasing the amount of contact teaching and increasing students’ entry-level knowledge of the topic area taught. Also serves as an indicator of students’ competence level before the course.</td>
<td>If literature is assigned for the exam, students might not understand difficult points merely by reading about them independently.</td>
</tr>
<tr>
<td>The teacher and students obtain information of the students’ competences well in advance, not only after the course has ended. Thus the teacher may modify his or her instruction or emphasise different issues as needed. Motivates students to take part in contact teaching and focus on learning throughout the course.</td>
<td>According to studies, continuous assessment efficiently supports students’ learning. Experience has shown that continuous assessment is also suitable for large groups.</td>
</tr>
<tr>
<td>Gives students an opportunity to learn by doing.</td>
<td>In excessively large groups, some students may be able to avoid work. There is also a risk of plagiarism if the topics are the same or older project reports are available. Students should be encouraged towards authentic learning; one cannot learn by copying the work of others. Fair assessment is not easy if the assignments and material differ.</td>
</tr>
<tr>
<td>Learning by doing and subsequent analysis; what happened, why it happened, etc. With appropriate instruction, also develops students’ scientific writing skills.</td>
<td>All group members might not make an equal contribution to writing the report, or if an individual report is required from each student, some may copy from others.</td>
</tr>
<tr>
<td>Writing an essay teaches students to organise their texts coherently and to examine issues from different perspectives.</td>
<td>Correcting essays takes a great deal of time, and fair assessment requires unambiguous assessment criteria, such as an assessment matrix.</td>
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## Annex. Different assessment methods 2/2

<table>
<thead>
<tr>
<th>ASSESSMENT METHOD</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>Homework</td>
<td>Students are given a more extensive assignment to complete at home. The assignment should be revised at different stages to ensure that the student is going in the right direction and provide guidance as needed.</td>
</tr>
<tr>
<td>Presentation</td>
<td>Students may demonstrate their knowledge by giving a presentation. A presentation is a good way to give students responsibility for their own learning and that of others, and have them participate in teaching.</td>
</tr>
<tr>
<td>Opponent work</td>
<td>Students study the work of another student and prepare questions and comments on it.</td>
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<tr>
<td>Learning journal</td>
<td>A learning journal is an experiential learning and assessment method. It helps to analyse how deep the student’s understanding is and examine the student’s experiences with regard to the subject area taught. The writer may apply e.g. Bloom’s taxonomy (Section 3.2.1). The learning journal may be a text file or a video journal sent to the teacher and/or other students.</td>
</tr>
<tr>
<td>Portfolio</td>
<td>Students compile a selection of their work. A portfolio may also include e.g. sections from the student’s learning journal. It may also be used for the recognition of prior learning.</td>
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<tr>
<td>ADVANTAGES</td>
<td>COMMENTS</td>
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<tr>
<td>Gives students time to think and solve problems, develops independent</td>
<td>Students may make serious mistakes if they take the wrong approach from the beginning and are not guided in the right direction. May mean a great deal of work for the teacher if students are allowed to solve their problem in different ways (e.g. in mathematical assignments, there may be more than one way to solve a problem) and the teacher guides students individually in the direction of their choice.</td>
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<td>initiative.</td>
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<td>Students must learn about the topic of their presentation in detail. Finding out things for themselves helps students to remember what they have learnt.</td>
<td>If no other assessment methods are used, students might focus only on their own presentation and neglect other topic areas. This method works best in combination with others.</td>
</tr>
<tr>
<td>Opponent work teaches scientific dialogue e.g. for subsequent conference presentations.</td>
<td>The teacher must remember to instruct students to understand that opponent work does not mean searching for mistakes, but posing all kinds of questions and making comments and giving grounds for them.</td>
</tr>
<tr>
<td>A learning journal helps students to analyse what they have learnt and recognise what they still need to learn.</td>
<td>Writing a learning journal takes practice. Unaccustomed writers may easily focus on describing what they have done instead of analysing what they have learnt.</td>
</tr>
<tr>
<td>Portfolios are frequently requested of job applicants. Therefore, using it as an assessment method is good practice for students. The portfolio may include different elements of the student’s work, e.g. demonstrations, or texts, images or audio and video files.</td>
<td>The assessment of portfolios requires more work from the teacher than conventional examinations. Instructions should be prepared carefully in advance in order to obtain all of the information necessary for assessment.</td>
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</tbody>
</table>
MY OBJECTIVES AS A TEACHER