

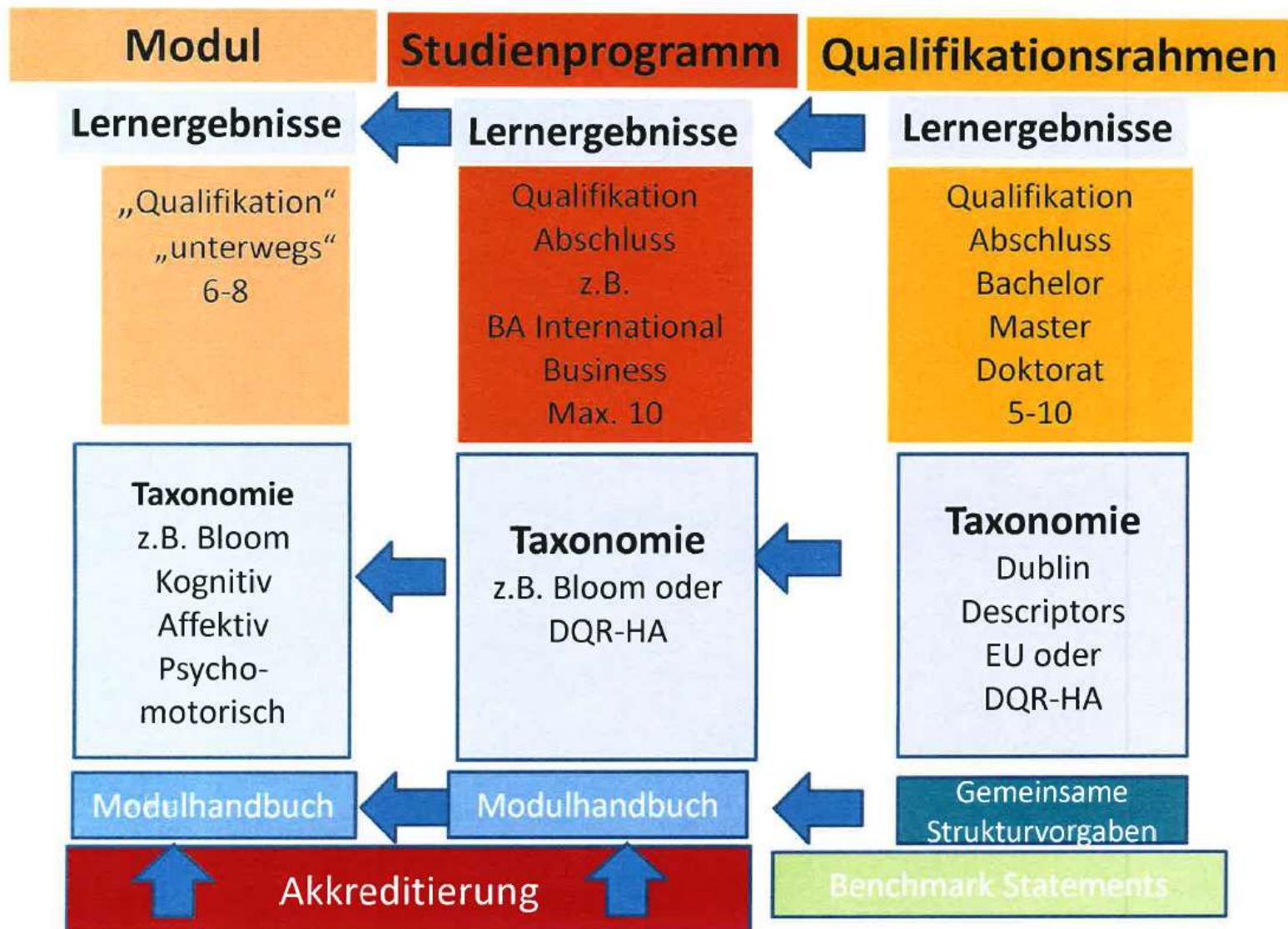
How to write Learning Outcomes

From the definition of LO it becomes obvious, the focus is

- on the learner
- His/her ability to do something

While aims and objectives of **teaching** are e.g. to know, understand, be familiar with

Learning focuses on the ability of the learner to define, list, recall, analyse...



Taxonomien

Dublin Descriptors	DQR-HA Descriptors
Knowledge and Understanding	Wissensverbreitung
Applying K&U	Wissensvertiefung
Making Judgements	Wissenserschließung / Können <ul style="list-style-type: none">- Instrumental- Kommunikativ- systemisch
Communicate	
Learn-to-Learn	



K

S

C

Qualifications Framework Institutional / Organisational

Osnabrueck

University of Applied Sciences

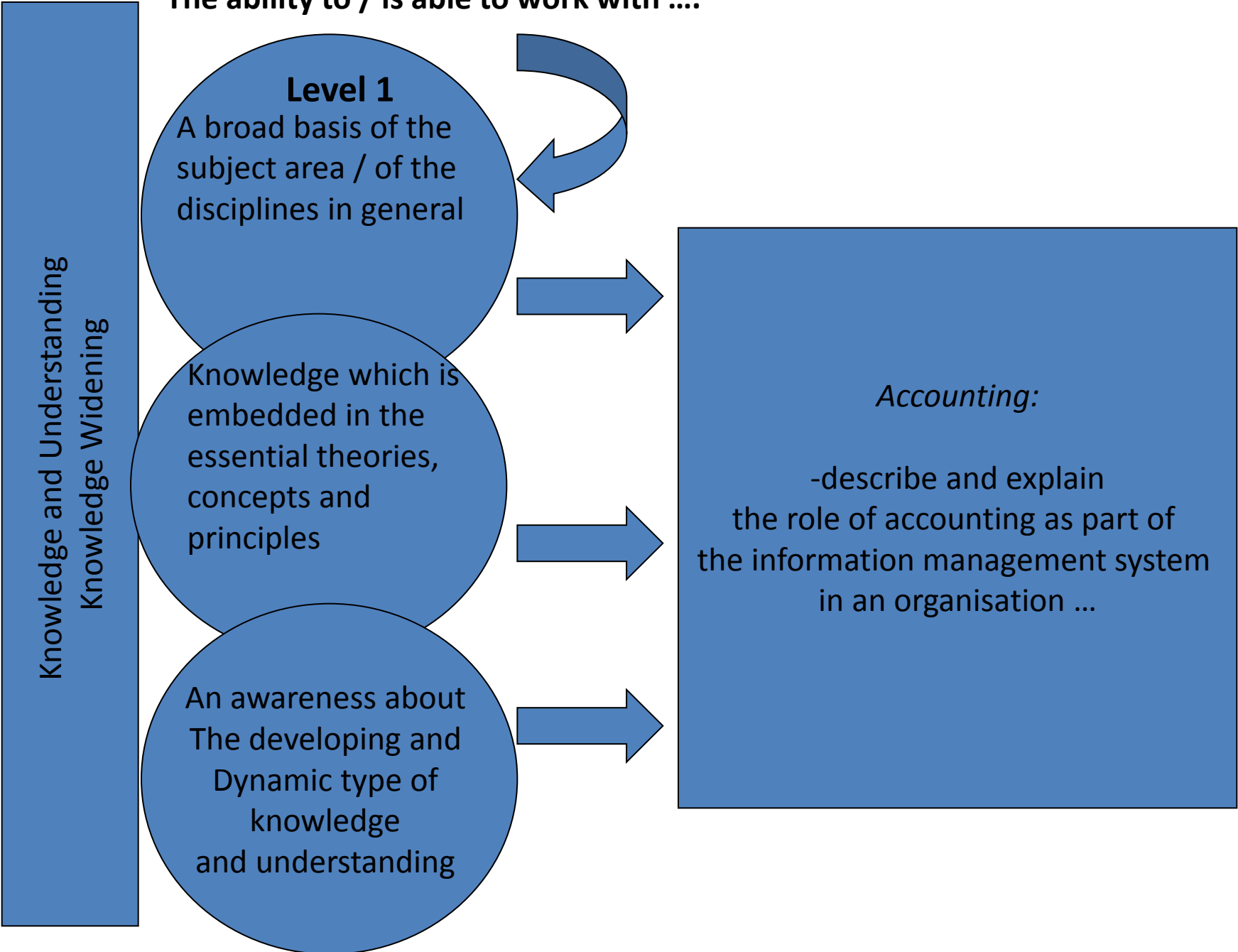
Learning Outcomes and Levels
Bachelor Degree 3 years

			Level 1 Descriptor	Level 2 Descriptor	Level 3 Descriptor
			The ability to demonstrate and / or work with		
Knowledge and Understanding	Knowledge widening	General	a broad knowledge of the subject/ discipline in general	a broad knowledge of the scope, defining features, and main areas of a subject/ discipline	a broad and integrated knowledge and understanding of the scope, main areas and boundaries of a subject/ discipline
			knowledge that is embedded in the main theories, concepts and principles	understanding of a limited range of core theories, principles and concepts	a critical understanding of a selection of the principal theories, principles, concepts and terminology
			an awareness of the evolving/ changing nature of knowledge and understanding	limited knowledge and understanding of some major current issues and specialisms	
				an outline knowledge and understanding of research and equivalent scholarly/ academic processes	
		Module related			
		Knowledge deepening	General	an understanding of the difference between explanations based in evidence and/ or research and other forms of explanation, and of the importance of the difference	detailed knowledge in some areas
		Module related			

	Terminology	<p><i>To acquire knowledge:</i> define, describe, identify, label, name, outline, reproduce, recall, select, state, present, extract, organise, recount, write, recognise, measure, underline, repeat, relate, match</p> <p><i>To understand knowledge</i> interpret, translate, estimate, justify, comprehend, convert, clarify, defend, distinguish, explain, extend, generalise, exemplify, give examples of, infer, paraphrase, predict, rewrite, summarise, discuss, perform, report, present, restate, illustrate, indicate, find, select, represent, name, formulate, judge, contrast, translate, classify, express, compare</p>		
	Example	<p><i>Accounting:</i> The student can describe and explain the role of Accounting within the Information Management System of a business organisation</p>	<p><i>Accounting:</i> The student can critically discuss and evaluate the various Accounting systems ...</p>	<p><i>Accounting:</i> The student can identify and critically evaluate the strategic options of the Information Management Systems of a business organisation</p>
Knowledge revealing/ opening and developing	General	<p><i>Instrumental - ICT and numeracy skills</i> use a wide range of routine skills and some advanced skills associated with the subject/ discipline - for example</p>		
		use a wide range of use standard applications to process and obtain a variety of information and data	use a range of standard applications to process and obtain data	Use a range of routine skills and some advanced and specialised skills in support of established practices in a subject/ discipline, for example - use a range of IT applications to support and enhance work - interpret, use and evaluate numerical and graphical data to achieve goals/ targets
		use a range of numerical and graphical skills in combination		
		use numerical and graphical data to measure progress and achieve goals/ targets	use and evaluate numerical and graphical data to measure progress and achieve goals/ targets	

Subject-related			
Terminology	use, apply, present, formulate, darstellen, examples: present, work out, calculate, statistically present, statistically underpin, and collect data, evaluate, assess, rank, present graphically, compile, match, put in order, merge, summarise, diagnose, categorise, propose, work out hypotheses, verify, falsify ...		
Example1	<i>Data processing:</i> The student is aware of some of the general characteristics of data basis.	<i>Data processing::</i> The student can assess the various alternatives to implement an information system	<i>Data processing::</i> The student understands the various activities which are necessary to implement technological change.
	Interpersonal / communicative - Generic cognitive skills and competences The student has the ability to		
	present and evaluate arguments, information and ideas which are routine to the subject discipline	undertake critical analysis, evaluation and/ or synthesis of ideas, concepts, information and issues which are within the common understandings of the subject/ discipline	undertake critical analysis, evaluation and/ or synthesis of ideas, concepts, information and issues
	use a range of approaches to addressing defined and/ or routine problems and issues within familiar contexts	use a range of approaches to formulate evidence-based solutions/ responses to defined and/ or routine problems/ issues	identify and analyse routine professional problems and issues
		critically evaluate evidence-based solutions/ responses to defined and/ or routine problems/ issues	draw on a range of sources in making judgements
	use a wide range of routine skills and some advanced skills associated with the subject/ discipline - for example - convey complex ideas in well-structured and coherent form - use a range of forms of communication effectively in both familiar and new contexts	use a range of routine skills and some advanced and specialised skills associated with a subject/ discipline- for example - convey complex information to a range of audiences and for a range of purposes	use a range of routine skills and some advanced and specialised skills in support of established practices in a subject/ discipline, for example - make formal and informal presentations on standard/ mainstream topics in the subject/ discipline to a range of audiences

The ability to / is able to work with



LO Knowledge

- List the criteria to be taken into account when caring for a patient with tuberculosis
- Define what behaviours constitute unprofessional practice in the solicitor-client relationship
- Describe the processes used in engineering when preparing a design brief for a client

LO Comprehension

- Identify participants and goals in the development of electronic commerce
- Explain the social, economic and political effects of World War I on the post-war world
- Recognise the forces discouraging the growth of the educational system in Ireland in the 19th century

LO Application

- Construct a timeline of significant events in the history of Australia in the 19th century
- Select and employ sophisticated techniques for analysing the effectiveness of energy usage in complex industrial processes
- Modify guidelines in a case study of a small manufacturing firm to enable tighter control of production.

LO Analysis

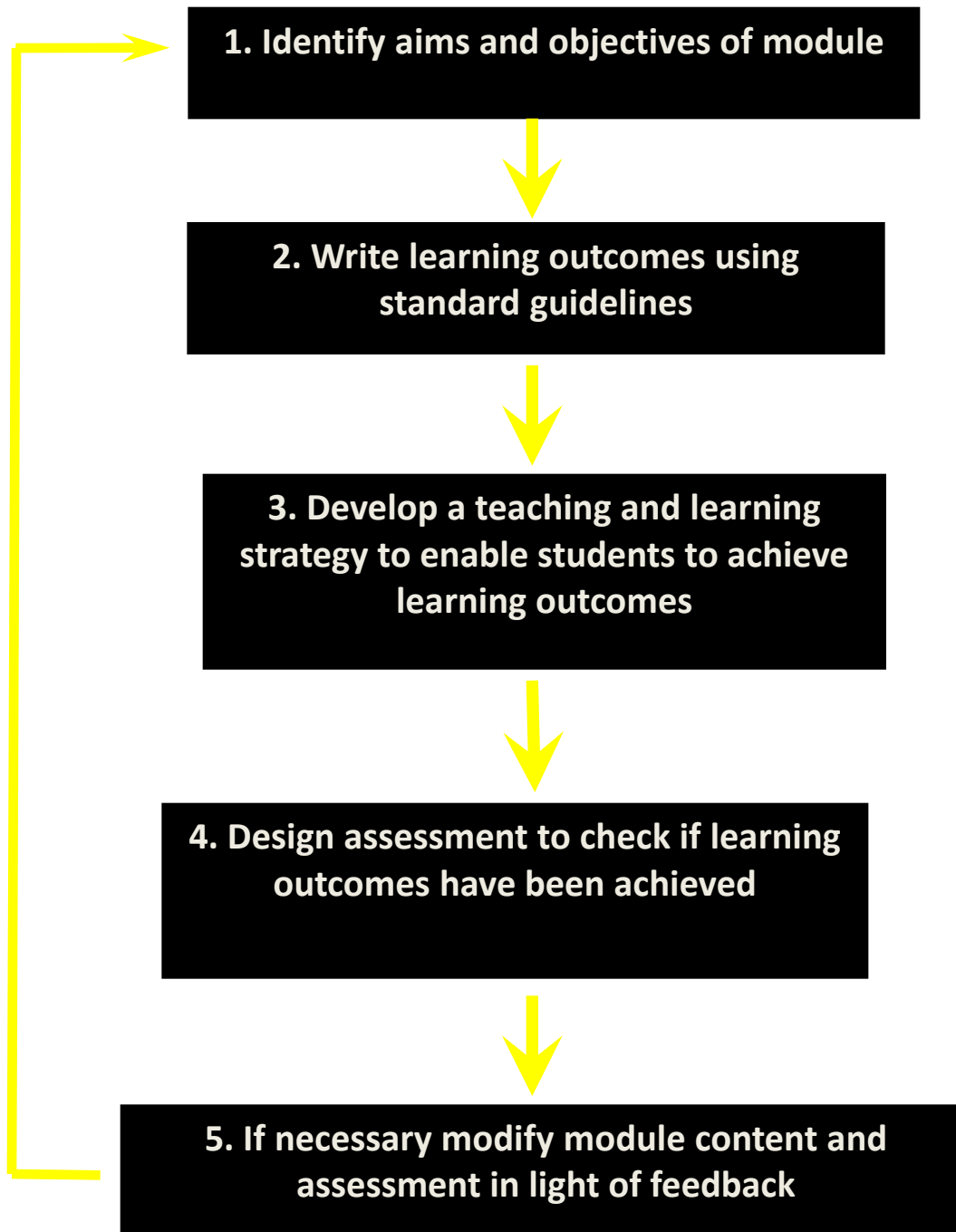
- Compare and contrast the different electronic business models
- Debate the economic and environmental effects of energy conversion processes.
- Compare the classroom practice of a newly qualified teacher with that of a teacher of 20 years teaching experience
- Calculate gradient from maps in m, km, % and ratio

LO Synthesis

- Recognise and formulate problems that are amenable to energy management solutions
- Propose solutions to complex energy management problems both verbally and in writing
- Organise a patient education programme
- Summarise the causes and effects of the 1917 Russian revolutions

LO Evaluation

- Assess the importance of key participants in bringing about change in Irish history
- Evaluate marketing strategies for different electronic business models
- Predict the effect of change of temperature on the position of equilibrium
- Evaluate the key areas contributing to the craft knowledge of experienced teachers



Example Business Studies

Module: Electronic Commerce

LO Knowledge

- Identify the main characteristics of electronic commerce
- Be aware of opportunities and threats

LO Comprehension

- Identify participants and goals in the development of electronic commerce

LO Application

- Develop a potential business plan for identified target groups of electronic commerce

LO Analysis

- Compare and differentiate various business forms of electronic commerce

LO Synthesis

- Summarise the reasons and effects of a specified model of electronic
- Organise a LLL-programme for customers

LO Evaluation

- Evaluate marketing strategies of various models of electronic commerce

Example

Criteria	<40	<50	<60	<70	<80	80+	Comments
Clarity and relevance of terms of reference/aims and objectives and these have been fully met							
Demonstration of knowledge, understanding and critical evaluation of relevant literature							
Justification and use of appropriate methods and data collection							
Evidence of systematic data collection and clear presentation and findings							
Critical analysis and interpretation of findings linking both secondary and primary research							
Appropriateness of conclusions and, where required, realistic and appropriate recommendations							
Evidence that personal learning has been reviewed – skills reflection							
Satisfactory presentation of material, consistent and appropriate referencing and clear and accurate use of English							
Overall Grade							

Business in Context (2004/2005)

Assignment

Criteria	Weighting	70%+	60-69%	50-59%	40-49%	Fail
	%					
Generic: Communication	5	Communicates to reader succinctly with very good clarity and coherence. There is good physical presentation.	Small element of distinctive coherence and structure and presentation missing.	Clear presentation of basic arguments and structure. Poor elements can be compensated by other good work.	Some element of coherent argument and structure.	Difficult to read and follow arguments. Very untidy physical presentation.
Knowledge & Understanding	20	Comprehensive, clear demonstration of required concepts and practical knowledge and understanding. Wide reading used	Mainly clear and comprehensive: small element missing or elementary.	Basic knowledge and understanding of material across board or incomplete compensated by good elements.	Elementary knowledge and understanding displayed. Incomplete.	Demonstrates no or very limited knowledge or understanding or required material.
Analysis	30	Demonstrates clear incisive ability to assess range of information analytically.	Demonstrates overall effective analysis of material, with some element missing allowed.	Basic analysis of material and comparisons.	Mainly descriptive; little analysis.	Descriptive only - no analysis.
Synthesis/ Creativity/ Application	10	Distinctive display of creativity and ability to synthesise material	Significant element of synthesis and creativity.	Small element of synthesising arguments and showing creativity displayed.	Limited/elementary creativity and synthesis.	No creativity or synthesis of material displayed.
Evaluation	30	Demonstrates clear, incisive ability to evaluate information in all forms.	Some (significant) element of incisive, clear evaluation, above basic level.	Basic evaluation of information and appropriateness of concepts and models.	Only elementary evaluation of material presented.	Extremely limited evaluation of material - both practical and concepts.
Assignment Parameters	5	Follows parameters/guidelines exactly as asked.	Small element of guidelines missing or inadequate.	Satisfactory, basic adherence to all guidelines or compensation by some distinctive element.	Small element of parameters/guidelines followed.	Parameters not followed.
Total	100					

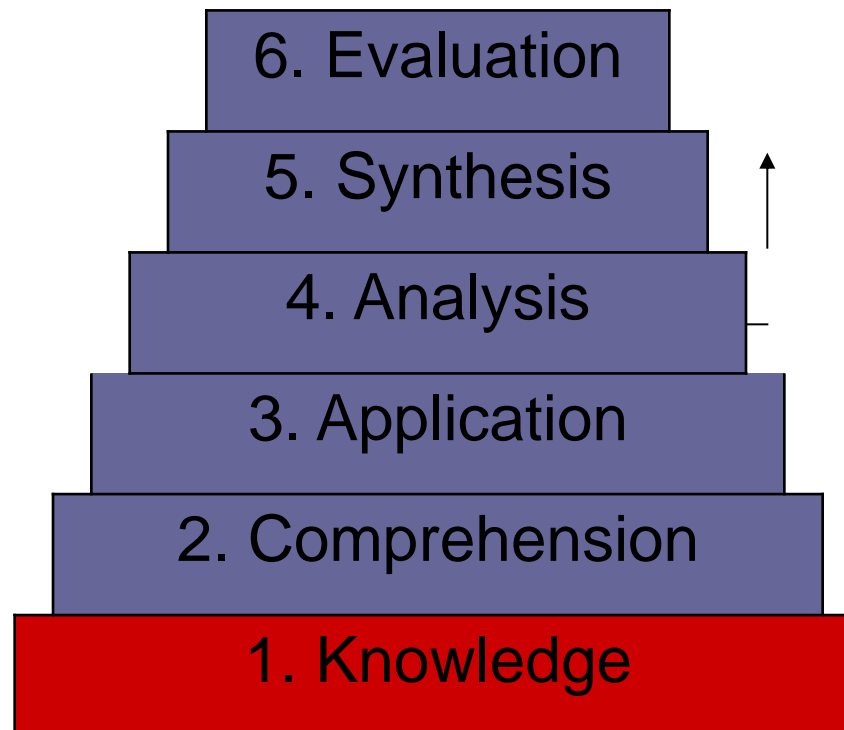
Bloom's Taxonomy

No categorisation

Presents processes of thinking hierarchically.

Each level of the hierarchy is determined by the ability of the learner to operate on this level or the ones below.

Cognitive Domains



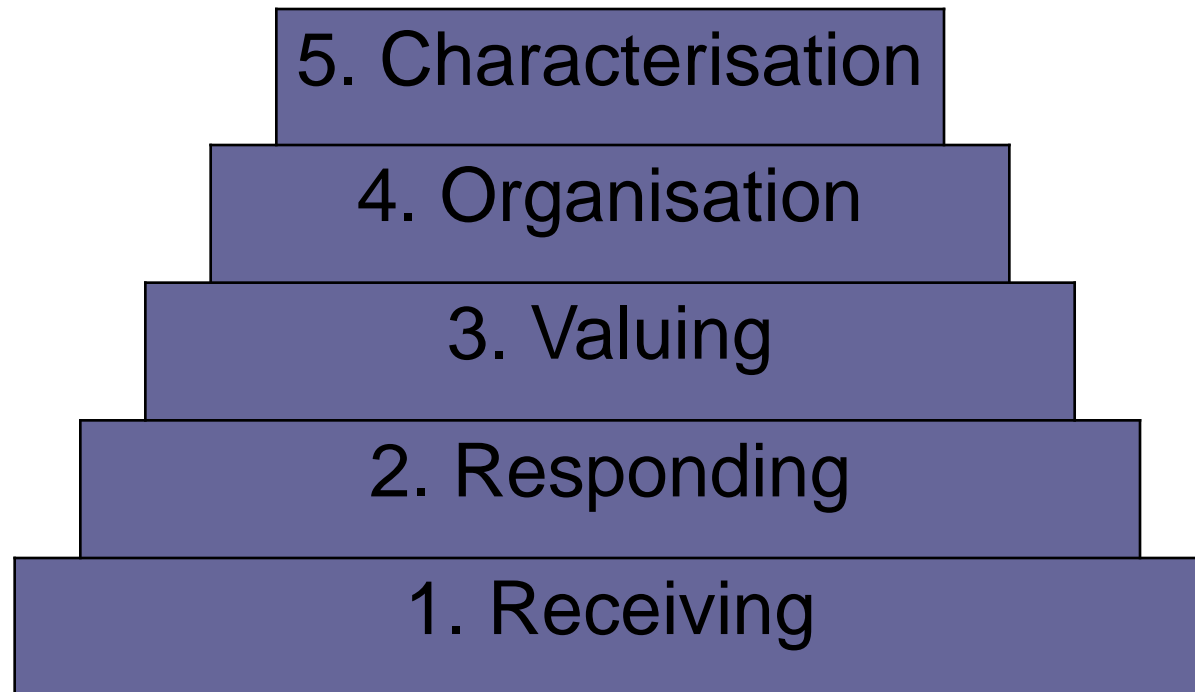
Examples of verbs to assess knowledge

Arrange, collect, define, describe, duplicate, enumerate, examine, find, identify, label, list, memorise, name, order, outline, present, quote, recall, recognise, recollect, record, recount, relate, repeat

Some examples of learning outcomes that demonstrate evidence of knowledge are:

- **Recall** genetics terminology: homozygous, heterozygous, phenotype, genotype, homologous chromosome pair, etc.
- **Identify** and consider ethical implications of scientific investigations.
- **Describe** how and why laws change and the consequences of such changes on society.
- **List** the criteria to be taken into account when caring for a patient with tuberculosis.
- **Define** what behaviours constitute unprofessional practice in the solicitor -client relationship.
- **Describe** the processes used in engineering when preparing a design brief for a client.

Affective Domaine



Receiving: Willingness to receive information, e.g. the individual accepts the need for a commitment to service, listens to others with respect, shows sensitivity to social problems, etc.

Responding: The individual is actively participating in his or her own learning, e.g. shows interest in the subject, is willing to give a presentation, participates in class discussions, enjoys helping others, etc.

Valuing: This ranges from simple acceptance of a value to one of commitment, e.g. the individual demonstrates belief in democratic processes, appreciates the role of science in our everyday lives, shows concern for the welfare of others, shows sensitivity towards individual and cultural differences, etc.

Organisation:

Process that individuals go through as they bring together different values, resolve conflicts among them and start to internalise the values,

e.g. recognises the need for balance between freedom and responsibility in a democracy, accepts responsibility for his or her own behaviour, accepts professional ethical standards, adapts behaviour to a value system, etc.

Evaluation

Characterisation:

At this level the individual has a value system in terms of his/her beliefs, ideas and attitudes that control their behaviour in a consistent and predictable manner, e.g. displays self reliance in working independently, displays a professional commitment to ethical practice, shows good personal, social and emotional adjustment, maintains good health habits, etc.

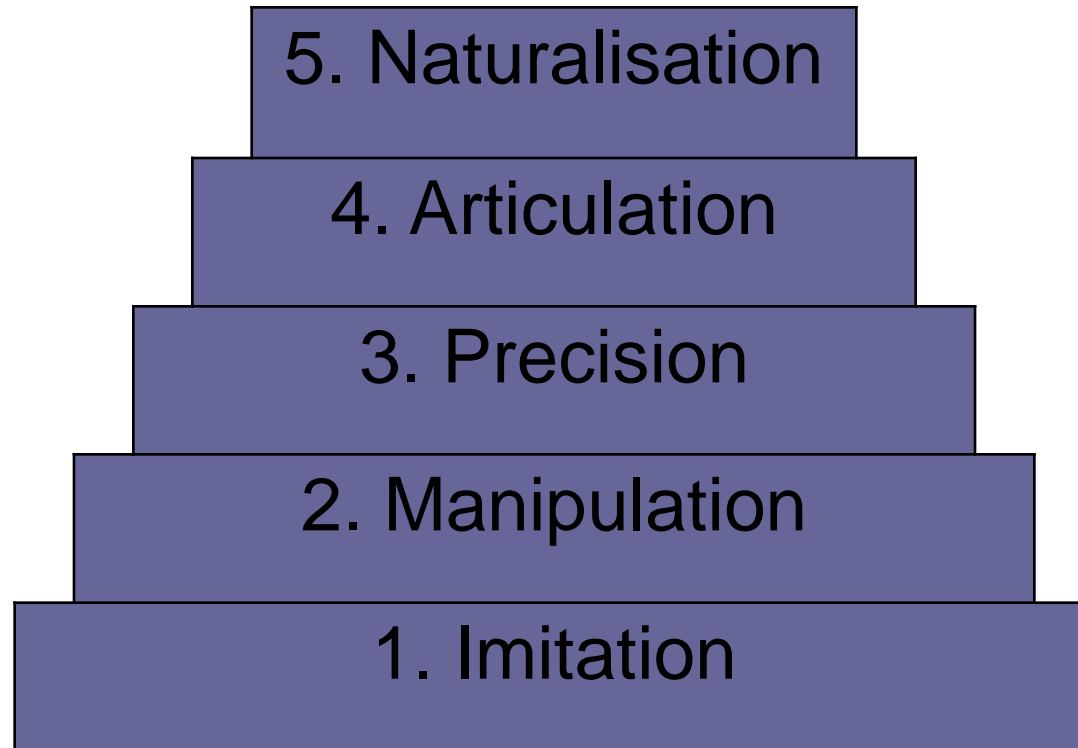
Some active verbs commonly used when writing learning outcomes for this domain

Act, adhere, appreciate, ask, accept, answer, assist, attempt, challenge, combine, complete, conform, cooperate, defend, demonstrate (a belief in), differentiates, discuss, display, dispute, embrace, follow, hold, initiate, integrate, justify, listen, order, organise, participate, practice, join, share, judge, praise, question, relate, report,

Some examples of learning outcomes in the affective domain are:

- Accept the need for professional ethical standards.
- Appreciate the need for confidentiality in the professional client relationship.
- Value a willingness to work independently.
- Relate well to students of all abilities in the classroom.
- Appreciate the management challenges associated with high levels of change in the public sector.
- Display a willingness to communicate well with patients.
- Resolve conflicting issues between personal beliefs and ethical considerations.
- Participate in class discussions with colleagues and with teachers.
- Embrace a responsibility for the welfare of children taken into care.
- Display a professional commitment to ethical practice.

Psychomotor Domaine (Dave 1970)



Imitation:

Observing the behaviour of another person and copying this behaviour. This is the first stage in learning a complex skill.

Manipulation:

Ability to perform certain actions by following instructions and practising skills.

Precision:

At this level, the student has the ability to carry out a task with few errors and become more precise without the presence of the original source. The skill has been attained and proficiency is indicated by smooth and accurate performance.

Articulation:

Ability to co-ordinate a series of actions by combining two or more skills. Patterns can be modified to fit special requirements or solve a problem.

Naturalisation:

Displays a high level of performance naturally (“without thinking”). Skills are combined, sequenced and performed consistently with ease.

Simpson (1972) – 7 levels

Perception:

The ability to use observed cues to guide physical activity.

Set (mindset):

The readiness to take a particular course of action.

This can involve mental, physical and emotional disposition.

Guided response:

The trial-and-error attempts at acquiring a physical skill.

With practice, this leads to better performance.

Mechanism:

The intermediate stage in learning a physical skill.

Learned responses become more habitual and movements can be performed with some confidence and level of proficiency.

Simpson (1972) – 7 levels (cont.)

Complex Overt Responses:

Physical activities involving complex movement patterns are possible. Responses are automatic and proficiency is indicated by accurate and highly coordinated performance with a minimum of wasted effort.

Adaptation:

At this level, skills are well developed and the individual can modify movements to deal with problem situations or to fit special requirements.

Origination:

The skills are so highly developed that creativity for special situations is possible.

Other taxonomies in this domain

Harrow (1972) and Dawson (1998)
Ferris and Aziz (2005) - specifically for engineering students.

In general:

all of the various taxonomies in this domain describe a progression from simple observation to mastery of physical skills.

Some active verbs commonly used when writing learning outcomes for this domain

Adapt, adjust, administer, alter, arrange, assemble, balance, bend, build, calibrate, choreograph, combine, construct, copy, design, deliver, detect, demonstrate, differentiate (by touch), dismantle, display, dissect, drive, estimate, examine, execute, fix, grasp, grind, handle, heat, manipulate, identify, measure, mend, mime, mimic, mix, operate, organise, perform (skilfully), present, record, refine, sketch, react, use.

Some examples of learning outcomes in the psychomotor domain are:

- Perform at least ten local anaesthetic administrations and evaluate your performance with your instructor.
- Prescribe and process at least ten radiographs and evaluate them with your instructor.
- Use a range of physiology equipment to measure physiological function.
- Operate the range of instrumentation specified in the module safely and efficiently in the chemistry laboratory.
- Administer successfully and in a safe manner with minimal risk to patient and operator, infiltration and regional nerve block anaesthesia.
- Present the methodology and findings of the research project in an oral report.
- Design a well-illustrated poster presentation to summarise the research project.
- Examine a patient extra-orally and intra-orally.
- Use the following software effectively and skilfully: MS Word, Excel and Powerpoint.
- Perform a surgical dressing using an aseptic technique.
- Sketch the pump characteristic curve, pipeline curve, the pump-pipeline operating point and show how each of these can be altered in a practical manner.
- Record an accurate impression of the mouth and identify all anatomical features of importance.

Good Practice

- The **key word is DO** and the **key need** in drafting learning outcomes is to use **active verbs**. (Jenkins and Unwin, 2001; Fry et al., 2000)
- **Try to avoid ambiguous verbs** such as “understand”, “know”, “be aware” and “appreciate”.(Bingham J., 1999)
- **Concrete verbs** such as “define”, “apply” or “analyse” are more helpful for assessment than verbs such as “be exposed to”, “understand”, “know” “be familiar with”.(Osters and Tiu, 2003)
- **Vague verbs such as “know” or “understand” are not easily measurable.** Substitute, “identify”, “define”, “describe” or “demonstrate”.(British Columbia Institute of Technology, 1996)

Good Practice cont.

- **Care** should be taken in using words such as **‘understand’** and **‘know’** if you cannot be sure that students will understand what it means to know or understand in a given text. (McLean and Looker, 2006)
- **Verbs relating to knowledge outcomes – “know”, “understand”, “appreciate” – tend to be rather vague, or to focus on the process students have gone through rather than the final outcome of that process,** so use action verbs – “solve”, evaluate, analyse – to indicate how students can demonstrate acquisition of that knowledge. (UCE Educational and Staff Development Unit)

Good Practice cont.

- Certain verbs are unclear and subject to different interpretations in terms of what action they are specifying. Such verbs call for covert behaviour which cannot be observed or measured.

These types of verbs should be avoided: know, become aware of, appreciate, learn, understand, become familiar with.

(American Association of Law Libraries)

Well formulated learning outcomes comprise at least three essential elements (see Moon 2004):

Subject

1. Use an active verb (learners are expected to know and be able to do) (e.g. „describe“, „implement“, „analyse“, „assess“, „plan“...)
Active Verb
2. Specify to what extent the learner can explain, present the „components“; can present the „components“ (e.g. „by hand“)
Object
3. Specify modality of learning (e.g. „to give a presentation“ most often used in e-learning research design by applying „interactive methods“, etc...)
Modality



That's all Folks.
Hope you learned
something about
learning outcomes!

