ASSESSMENT OF STUDENT LEARNING OUTCOMES AT UNIVERSITY LEVEL

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WHO AM I?

Bachelor's Degree in Physical Sciences (specialization of Electronics) from the University of Granada. PhD doctorate with the highest Cum Laude rating. Currently he is member of TEP968 “Technologies for a circular economy” research group.

Teaching experience. He has taught and supervised teaching undergraduate, master's and doctoral courses in Environmental Science, Chemistry, Physics, Biology, Mathematics, Telecommunications Engineering, Architecture, Civil Engineering and Computer Engineering degrees. Among the master course teaching, he coordinated subjects and teaching courses in the Masters of Environmental Engineering, Acoustic Engineering, Occupational Risk Prevention and Management and Integral Safety Building.

Teaching Excellence Awards: in 2017 in individual category in the subject of Science and in 2020 in group category for the Teaching Group in the Faculty of Sciences.

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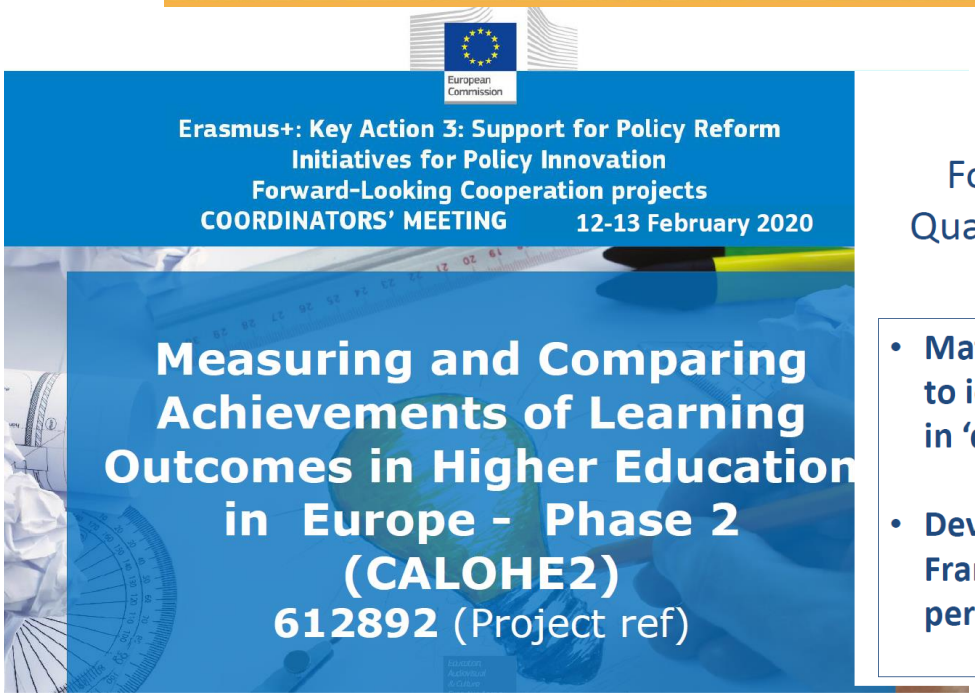

Aim of the project

Follow-up of CALOHEE 2016-18 project: developed Qualifications Framework for Civil Engineering, History, Nursing, Physics, Teacher Education

- **Matching of Frameworks against existing degree programmes to identify omissions, strength and weaknesses. Offers insight in 'quality and relevance current HE programmes**
- **Development of an applicable and fair instrument (based on Frameworks) to measure performance in international perspective at the end of the first cycle.**

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Erasmus+ UNLOCK Project

Research Work Package: 2 major questions

How can escape games be used for pedagogical purposes in HEIs and, specifically, to improve creativity as a crucial entrepreneurial skill?

How can educators be prepared to facilitate and legitimise educational escape games in HEIs, namely their role in a game base teaching activity?

At the end of this talk you should be able to:

1. *Be convinced why learning outcomes have become the international language of education.*
2. *Define or formulate* program/course *learning outcomes or PLOs / CLOs*.
3. *Define tasks and results for CLOs*
4. *Know different assessments tools related to CLOs.*
5. *Know a protocol to design rubrics as evaluation tool for PLOs.*

At the end of this talk you should be able to:

1. *Discuss why learning outcomes have become the international language of education.*
2. *Define or formulate* program/course *learning outcomes or PLOs / CLOs*.
3. *Define tasks and results for CLOs*
4. *Know different assessments tools related to CLOs.*
5. *Know a protocol to design rubrics as evaluation tool for PLOs.*

Be aware of the importance of assessment in learning process

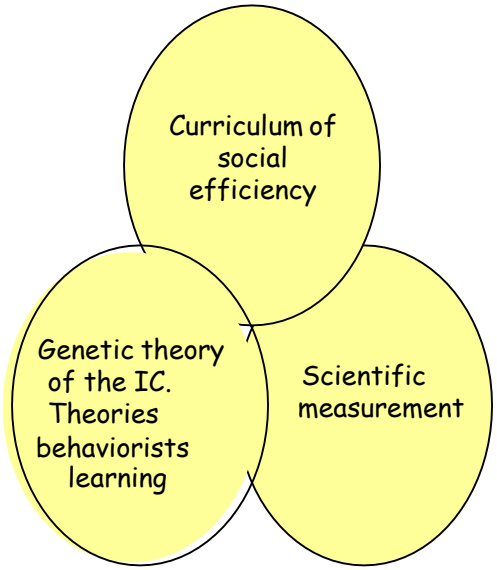
BEAR IN MIND

- To improve learning, teaching must be improved, not only assessment systems
- The evaluation systems must be in accordance with teaching concepts applied
- Scores "respond" to an arbitrary one, there is no point to be fair and objective, it can only be rational
- A single evidence, a single type of evidence does not allow evaluating
- Every form of evaluation has a degree of error, you should assume this.

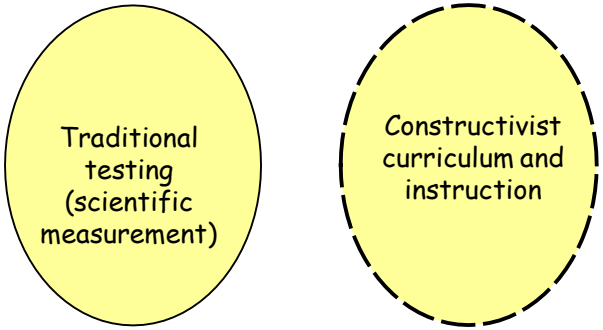
Didactic evaluation

- Responds to the established teaching strategy
- It requires having several evidences
- It can become a field for teaching experimentation or research
- Requires mixing both activities that aim at outputs with activities for evaluating the learning process.

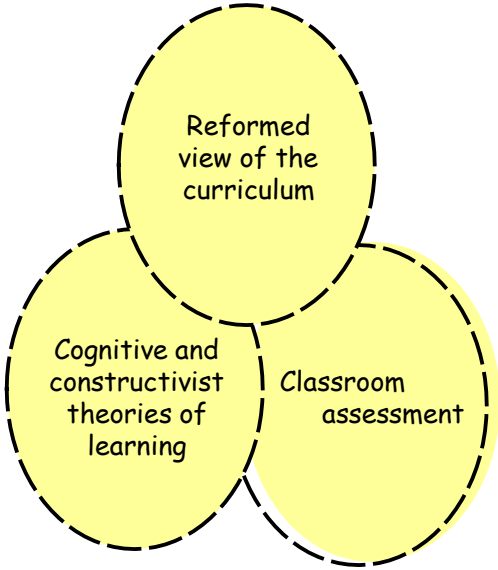
TRENDS



Dominant paradigm during the 20th century (1900-2000)

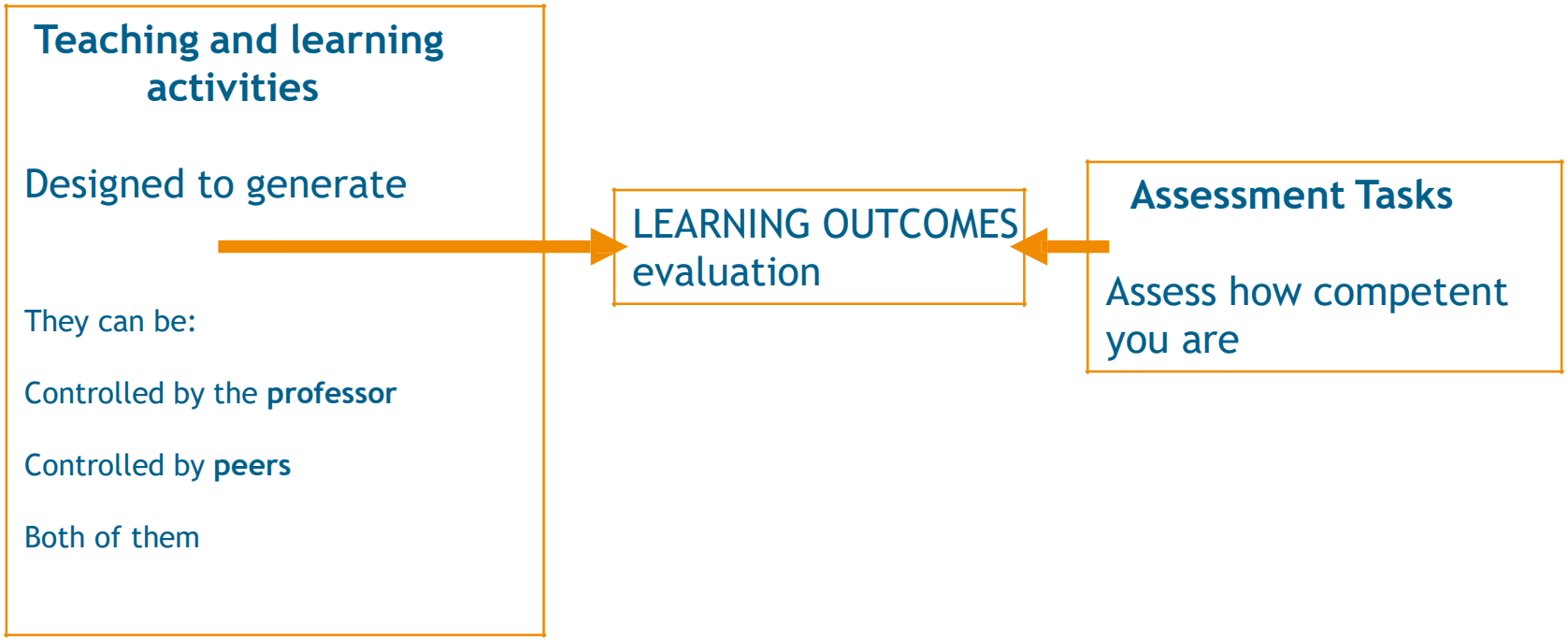


Dissolving the Old Paradigm: New Perspectives on Instruction / Old Perspectives on Assessment (1980-2000)



Emerging paradigm (1990-2000 +)

ALIGNMENT OF TEACHING-LEARNING-EVALUATION



The impact of the evaluation happens:

- ***Before*** of the evaluation: by anticipating what will happen
- ***During*** the assessment: allowing students reveal or hide their learning
- ***After the*** evaluation: to the extent that the students choose to deepen or avoid

The evaluation constrains the learning of the students, if it is a rote based evaluation, students will learn by heart (rote). If there are cooperative evaluations, you will encourage cooperative learning.

We need to move from:

How can we develop reliable and valid tests, exams and tests?

and

How can we ensure that both a formative and a summative assessment occur?

TO

How do we ensure that the assessment supports learning?

and

How can assessment be used to develop students' capacity for lifelong learning and the ability to make judgments?

(Boud, 2007)

A **learning result** it is what a student is expected to know, understand and be able to demonstrate. It refers to the changes that have occurred in the student's knowledge, understanding and competence level as a consequence of the learning process

Contents

- Traditional Education
- Outcome Based Education (OBE)
- Program learning outcomes (PLOs)
- Course learning outcomes (CLOs)
- Assessment of CLOs: defining tasks and results.
- Assessment of CLOs: instrument for assessment.
- Assessment of CLOs: examples.
- Conclusions Q&A

Main drawbacks of traditional evaluation

- Provides students with a learning environment with little attention to whether or not students ever learn the material.
- Students are given grades and rankings compared to each other – students become **exam oriented or exam driven**.
- Graduates are not completely prepared for the workforce.
- Lack of emphasis on soft skills needed in jobs e.g. communication skills, interpersonal skills, analytical skills, etc.

Outcome-Based Education

OBE addresses the following key questions:

- What do we want the students to have or be able to do?
- How best can we help students achieve it?
- How will we know whether the students have achieved it?
- How do we close the loop for further improvement (Continuous Quality Improvement (CQI))?

Outcome-Based Education

Example of Assessment Methods for Program Outcome : Capability to Communicate Effectively

Performance Criteria	Subjects	Assessment Methods	Documents to be Kept
• Present and document ideas and experimental results properly documented in a specified format, and supported with evidence. The document must contain explanation with sufficient detail, with minimum grammatical and spelling errors.	• All Subjects- Lab Experiments, FYP, ITP, Mini Projects	• Coursework and exam • presentation of Final Year Project and Industrial Training reports • Lab Reports	Exam scripts and assignment Final Year Project and Industrial Training reports and mark sheets, lab reports,
• Use multimedia content in oral and visual communication	• EPT4046 Final Year Project, EPT4066 Industrial Training • Mini Project • Other Seminars, and • Meetings	• Presentation of Final Year Project, Industrial Training, Mini projects and other seminars	Final Year Project and Industrial Training, Mini Projects mark sheets, PowerPoint presentation slides. Attendance records in other seminars
• Respond to audience's questions correctly and confidently	• EPT4046 Final Year Project, EPT4066 Industrial Training, • EPT3016 Mini Project, • other seminars and • meetings	• Presentation of Final Year Project, Industrial Training, Mini projects and other seminars	Final Year Project and Industrial Training, Mini Projects mark sheets, PowerPoint presentation slides. Student attendance records in other seminars

Co-funded by the
Erasmus+ Programme
of the European Union

MEASURING AND COMPARING ACHIEVEMENTS OF LEARNING OUTCOMES IN HIGHER EDUCATION IN EUROPE (CAL0HEE)

SUBJECT AREA QUALIFICATIONS REFERENCE FRAMEWORKS
(META-PROFILES) FOR:

CIVIL ENGINEERING HISTORY NURSING PHYSICS TEACHER EDUCATION

BASED ON A MERGER OF THE (BOLOGNA PROCESS) *QUALIFICATIONS FRAMEWORK OF THE EUROPEAN HIGHER EDUCATION AREA* AND THE (EUROPEAN UNION) *EUROPOPEAN QUALIFICATIONS FRAMEWORK FOR LIFE LONG LEARNING*

2018
University of Groningen

CALOHEE website: https://www.calohee.eu

Co-funded by the
Erasmus+ Programme
of the European Union

TUNING Educational Structures in Europe reflects the idea that universities do not look for uniformity in their degree programmes or any sort of unified, prescriptive or definitive European curricula, but rather for points of reference, convergence and common understanding. The protection of the rich diversity of European education has been paramount in TUNING from the very start and it in no way seeks to restrict the independence of academic and subject specific specialists, or undermine local and national academic authority.

Explanation

The Subject Area Qualifications Reference Frameworks (Meta-Profiles) presented here are the outcomes of elaborations by groups of informed academics and students and of consultations of a wide circle of stakeholders. The frameworks have been developed in the setting of the project *Measuring and Comparing Achievements of Learning Outcomes in Higher Education in Europe*, which is an integral part of the TUNING initiative to modernize higher education.

The Reference Frameworks are based on a merger of the Qualifications Framework of the European Higher Education Area (QF of the EHEA) and the European Qualifications Framework for Lifelong Learning (EQF for LLL). Their integration allows for combining two different philosophies and facilitates the use of the frameworks presented here in different contexts. While the QF of the EHEA covers in particular the learning process, the EQF focusses on the preparation for life in society and the world of work.

The descriptors in the Reference Frameworks are organized on the basis of 'dimensions'. A dimension indicates a constructive key element, which defines a subject area. Each subject area is based on a multiple of dimensions. These dimensions are linked to the five strands of the QF of the EHEA. By applying the categories of the EQF for LLL each dimension involves three descriptors – knowledge, skills and autonomy and responsibility ('wider competences') -, which reflect a progressive level of achievement.

The Subject Area Qualifications Reference Frameworks are meant to serve as a sound basis for defining the *programme learning outcomes* of individual degree programmes of the first and second cycle (BA and MA). Basing the individualized sets of learning outcomes on the frameworks will guarantee that 'standards' which have been agreed and validated internationally are fully respected. It also implies full alignment with the overarching descriptors of the two European Qualifications Frameworks and, consequently, with the National Qualifications Frameworks. Templates in WORD are available on the CALOHEE website:

https://www.calohee.eu

TEMPLATE FIRST CYCLE – BACHELOR – LEVEL 6

TUNING Qualifications Reference Framework (Meta-Profile) General Descriptors of a Bachelor Programme in the Subject Area of …….. (LEVEL 6)

QF EHEA 1st cycle descriptors	SQF domain dimensions Level 6 (BACHELOR)	EQF descriptor Knowledge Level 6 *Advanced knowledge of a field of work or study, involving a critical understanding of theories and principles*	EQF descriptor Skills Level 6 *Advanced skills, demonstrating mastery and innovation, required to solve complex and unpredictable problems in a specialised field of work or study*	EQF descriptor Autonomy and Responsibility (Wider Competences) Level 6 *-Manage complex technical or professional activities or projects, taking responsibility for decision-making in unpredictable work or study contexts* *-Take responsibility for managing professional development of individuals and groups*
Special feature degree programme			.	
I. *Have demonstrated knowledge and understanding in a field of study that builds upon their general secondary education, and is typically at a level that, whilst supported by advanced textbooks, includes some aspects that will be informed by knowledge of the forefront of their field of study*		.		
II. *Can apply their knowledge and understanding in a manner that indicates a professional approach to their work or vocation, and have competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study*				.
III. *Have the ability to gather and interpret relevant data (usually within their field of study) to inform judgements that include reflection on relevant social, scientific or ethical issues*				
IV. *Can communicate information, ideas, problems and solutions to both specialist and non-specialist audiences*				
V. *Have developed those learning skills that are necessary for them to continue to undertake further study with a high degree of autonomy*				

TEMPLATE Second Cycle –- Master – Level 7

TUNING Qualifications Reference Framework (Meta-Profile) General Descriptors of a Master Programme in the Subject Area of …….. (LEVEL 7)

QF EHEA 2nd cycle descriptors	SQF domain dimensions Level 7 (MASTER)	EQF descriptor Knowledge Level 7 *-Highly specialised knowledge, some of which is at the forefront of knowledge in a field of work or study, as the basis for original thinking and/or research* *-Critical awareness of knowledge issues in a field and at the interface between different fields*	EQF descriptor Skills Level 7 *- Specialised problem-solving skills required in research and/or innovation in order to develop new knowledge and procedures and to integrate knowledge from different fields*	EQF descriptor Autonomy and Responsibility (Wider Competences) Level 7 *- Manage and transform work or study contexts that are complex, unpredictable and require new strategic approaches* *- Take responsibility for contributing to professional knowledge* *and practice and/or for reviewing the strategic performance of teams*
Special feature degree programme				
I. *Have demonstrated knowledge and understanding that is founded upon and extends and/or enhances that typically associated with Bachelor's level, and that provides a basis or opportunity for originality in developing and/or applying ideas, often within a research context*				
II. *Can apply their knowledge and understanding, and problem solving abilities in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their field of study*				
III. *Have the ability to integrate knowledge and handle complexity, and formulate judgements with incomplete or limited information, but that include reflecting on social and ethical responsibilities linked to the application of their knowledge and judgements*				
IV. *Can communicate their conclusions, and the knowledge and rationale underpinning these, to specialist and non-specialist audiences clearly and unambiguously*				
V. *Have the learning skills to allow them to continue to study in a manner that may be largely self-directed or autonomous*				

TUNING Qualifications Reference Framework (Meta-Profile) of General Descriptors of a Bachelor Programme in the Subject Area of CIVIL ENGINEERING (LEVEL 6)

QF EHEA 1st cycle descriptors	SQF domain dimensions Level 6 (BACHELOR)	EQF descriptor Knowledge Level 6 *Advanced knowledge of a field of work or study, involving a critical understanding of theories and principles*	EQF descriptor Skills Level 6 *Advanced skills, demonstrating mastery and innovation, required to solve complex and unpredictable problems in a specialised field of work or study*	EQF descriptor Autonomy and Responsibility (Wider Competences) Level 6 *-Manage complex technical or professional activities or projects, taking responsibility for decision-making in unpredictable work or study contexts* *-Take responsibility for managing professional development of individuals and groups*
Special feature degree programme		Demonstrate knowledge and understanding of the disciplinary, professional, personal and interpersonal requirements necessary to solve / design / investigate / conduct complex civil engineering problems / products, processes and systems / issues / activities	Apply knowledge and understanding to solve / design / investigate / conduct complex civil engineering problems / products, processes and systems / issues / activities.	Identify appropriate and relevant established method to solve / design / investigate / conduct complex civil engineering problems / products, processes and systems / issues / activities and be aware of professional, ethical and social responsibilities.
I. *Have demonstrated knowledge and understanding in a field of study that builds upon …*	**1. Knowledge and Understanding**	Demonstrate knowledge and understanding of mathematics as well as sciences and engineering disciplines underlying civil engineering specialisation at a level necessary to achieve the other programme outcomes.	Apply knowledge and understanding of mathematics as well as sciences and engineering disciplines underlying civil engineering specialisation to solve / design / investigate / conduct complex civil engineering problems / products, processes and systems / issues / activities.	Identify knowledge and understanding of mathematics as well as sciences and engineering disciplines underlying civil engineering specialisation necessary to solve / design / investigate / conduct complex civil engineering problems / products, processes and systems / issues / activities.
II. *Can apply their knowledge and understanding in a manner that indicates a professional approach to their work or vocation, and have competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study*	**2. Analysis and Problem Solving**	Demonstrate knowledge and understanding of the processes and established methods of analysis / solution of engineering issues (products, processes, systems, situations) / engineering problems in the civil engineering subject area and of their limitations.	Analyse / solve complex engineering issues (products, processes, systems, situations) / engineering problems in civil engineering subject area by applying appropriate and relevant established methods of analysis / solution.	Identify appropriate and relevant established methods of analysis / solution of complex civil engineering issues (products, processes, systems, situations) / engineering problems.
	3. Design	Demonstrate knowledge and understanding of the process and established methods of design in civil engineering subject area and of their limitations.	Design complex civil engineering products (devices, artefacts, etc.), processes and systems by applying appropriate and relevant established design methods.	Identify appropriate and relevant established design methods of complex civil engineering products (devices, artefacts, etc.), processes and systems.
	4. Investigations	Demonstrate knowledge and understanding of codes of practice and safety regulations and of investigation methods (consultation of sources of information, simulations, experimental methods) in civil engineering subject area and of their limitations.	Consult and apply codes of practice and safety regulations and conduct investigations (consultation of sources of information, simulations, experimental methods) in civil engineering subject area in order to meet specified needs and report the investigation results.	Identify appropriate and relevant investigation approaches (among codes of practice and safety regulations, consultation of sources of information, simulations, experimental methods) in civil engineering subject area and analyse, explain and interpret the investigation results with respect to the needs to be met.
	5. Practice	Demonstrate practical knowledge and understanding of materials, equipment and tools, processes and technologies in civil engineering subject area and of their limitations.	Conduct complex engineering activities in civil engineering subject area, using and applying practical knowledge and understanding of materials, equipment and tools, processes and technologies.	Identify practical knowledge and understanding of materials, equipment and tools, processes and technologies necessary to conduct complex engineering activities in civil engineering subject area.
III. *Have the ability to gather and interpret relevant data (usually within their field of study) to inform judgements ..*	**6. Decision making**	Demonstrate awareness of the key aspects of professional, ethical and social responsibilities linked to management of civil engineering activities, decision making and judgment formulation.	Manage work contexts in civil engineering subject area, take decisions and formulate judgments.	Identify appropriate and relevant approaches to manage work contexts in civil engineering subject area and reflect on professional, ethical and social responsibilities in taking decisions and formulating judgments.
IV. *Can communicate information, ideas, problems and solutions to both specialist and non- specialist audiences*	**7. Team-working**	Demonstrate knowledge and understanding of functioning methods of teams that may be composed of different disciplines and levels.	Function effectively in national and international contexts as member of teams that may be composed of different disciplines and levels contributing to meet deliverable, schedule and budget requirements.	Identify appropriate functioning methods and relevant management strategies of teams that may be composed of different disciplines and levels and elements of successful teamwork.
	8. Communication	Demonstrate knowledge and understanding of established communication methods and tools and of their limitations.	Communicate effectively, clearly and unambiguously information, describe activities and communicate their exits/results to engineers or wider audiences in national and international contexts, using appropriate established communication methods and tools.	Identify appropriate and relevant established communication methods and tools.
V. *Have developed those learning skills that are necessary for them to continue to undertake further study …*	**9. Lifelong Learning**	Demonstrate knowledge and understanding of the learning methods necessary to follow developments in science and technology in civil engineering subject area.	Engage in independent lifelong learning and follow developments in science and technology in civil engineering subject area autonomously.	Identify appropriate learning methods in independent lifelong learning to follow developments in science and technology in civil engineering subject area.

TUNING Qualifications Reference Framework (Meta-Profile) of General Descriptors of a Master Programme in the Subject Area of CIVIL ENGINEERING (LEVEL 7)

QF EHEA 2nd cycle descriptors	SQF domain dimensions Level 7 (MASTER)	EQF descriptor Knowledge Level 7 *-Highly specialised knowledge, some of which is at the forefront of knowledge in a field of work or study, as the basis for original thinking and/or research* *-Critical awareness of knowledge issues in a field and at the interface between different fields*	EQF descriptor Skills Level 7 *- Specialised problem-solving skills required in research and/or innovation in order to develop new knowledge and procedures and to integrate knowledge from different fields*	EQF descriptor Autonomy and Responsibility (Wider Competences) Level 7 *- Manage and transform work or study contexts that are complex, unpredictable and require new strategic approaches* *- Take responsibility for contributing to professional knowledge and practice and/or for reviewing the strategic performance of teams*
Special feature degree programme		Demonstrate knowledge and understanding of the disciplinary, professional, personal and interpersonal requirements necessary to solve / design / investigate / conduct very complex civil engineering problems / products, processes and systems / issues / activities	Apply knowledge and understanding to solve / design / investigate / conduct very complex civil engineering problems / products, processes and systems / issues / activities.	Identify and justify appropriate and relevant established method or new and innovative methods to solve / design / investigate / conduct very complex civil engineering problems / products, processes and systems / issues / activities and behave according to professional, ethical and social responsibilities.
I. *have demonstrated knowledge and understanding that is …*	**1. Knowledge and Understanding**	Demonstrate in-depth knowledge and understanding of mathematics as well as sciences and engineering disciplines underlying civil engineering specialisation at a level necessary to achieve the other programme outcomes.	Apply knowledge and understanding of mathematics as well as sciences and engineering disciplines underlying civil engineering specialisation to solve / design / investigate / conduct very complex civil engineering problems / products, processes and systems / issues / activities.	Identify and justify knowledge and understanding of mathematics as well as sciences and engineering disciplines underlying civil engineering specialisation necessary to solve / design / investigate / conduct very complex civil engineering problems / products, processes and systems / issues / activities.
II. *can apply their knowledge and understanding, and problem solving abilities in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their field of study*	**2. Analysis and Problem Solving**	Demonstrate comprehensive knowledge and understanding of the processes and methods of analysis / solution of engineering issues (products, processes, systems, situations) / engineering problems in the civil engineering subject area, including new and innovative methods, and of their limitations.	Analyse / solve very complex engineering issues (products, processes, systems, situations) / engineering problems in civil engineering subject area by applying appropriate and relevant methods of analysis / solution.	Identify and justify appropriate and relevant methods of analysis / solution of very complex civil engineering issues (products, processes, systems, situations) / engineering problems from established or new and innovative methods.
	3. Design	Demonstrate comprehensive knowledge and understanding of the process and methods of design in civil engineering subject area, including new and original methods, and of their limitations.	Conceive and design very complex civil engineering products (devices, artefacts, etc.), processes and systems by applying appropriate and relevant design methods.	Identify and justify appropriate and relevant design methods of very complex civil engineering products (devices, artefacts, etc.), processes and systems from established or new and innovative methods.
	4. Investigations	Demonstrate comprehensive knowledge and understanding of codes of practice and safety regulations and of investigation methods (consultation of sources of information, simulations, experimental methods) in civil engineering subject area, including new and original emerging methods, and of their limitations.	Consult and apply codes of practice and safety regulations and conduct investigations (consultation of sources of information, simulations, experimental methods) in civil engineering subject area and within broader or multidisciplinary contexts in order to meet specified needs and report the investigation results.	Identify and justify appropriate and relevant investigation approaches (among codes of practice and safety regulations, consultation of sources of information, simulations, experimental methods) in civil engineering subject area and within broader or multidisciplinary contexts, and analyse, explain and critically evaluate the investigation results with respect to the needs to be met.
	5. Practice	Demonstrate comprehensive practical knowledge and understanding of materials, equipment and tools, processes and technologies in civil engineering subject area and of their limitations.	Implement and conduct complex engineering activities in civil engineering subject area and within broader or multidisciplinary contexts, using and applying practical knowledge and understanding of materials, equipment and tools, processes and technologies.	Identify and justify practical knowledge and understanding of materials, equipment and tools, processes and technologies necessary to conduct complex engineering activities in civil engineering subject area and within broader or multidisciplinary contexts.
III. *have the ability to integrate knowledge and handle complexity, …*	**6. Decisions making**	Demonstrate critical awareness of the key aspects of professional, ethical and social responsibilities linked to management of work contexts, decision-making and judgment formulation in civil engineering subject area.	Manage work contexts in civil engineering subject area and within broader or multidisciplinary contexts that may be unpredictable and require new strategic approaches, take decisions and formulate judgments.	Identify ad justify appropriate and relevant strategic approaches and analyse professional, ethical and social responsibilities linked to the management of work contexts in civil engineering subject area and within broader or multidisciplinary contexts, taking coherent decisions and formulating coherent judgments.
IV. *can communicate their conclusions, and the knowledge and rationale underpinning these, to specialist and non-specialist audiences clearly and unambiguously*	**7. Team-working**	Demonstrate knowledge and understanding of functioning methods and management strategies of teams that may be composed of different disciplines and levels and awareness of leadership responsibilities.	Function effectively in national and international contexts as member/leader of teams that may be composed of different disciplines and levels meeting deliverable, schedule and budget requirements.	Identify ad justify appropriate and relevant functioning methods and management strategies of teams that may be composed of different disciplines and levels and elements of successful teamwork.
	8. Communication	Demonstrate knowledge and understanding of communication strategies, methods and tools, including new and innovative ones, and of their limitations.	Communicate effectively, clearly and unambiguously information, describe activities and communicate their exits/results – and the knowledge and rationale underpinning these – to specialist and non-specialist audiences in national and international contexts and society at large, using appropriate communication strategies, methods and tools.	Identify and justify appropriate and relevant communication strategies, methods and tools from established or new and innovative ones.
V. *have the learning skills to allow them to continue to study in a manner that may be largely …*	**9. Lifelong Learning**	Demonstrate knowledge and understanding of the learning methods necessary to follow developments in science and technology and undertake further studies in new and emerging technologies in civil engineering subject area and within broader or multidisciplinary contexts.	Engage in independent lifelong learning and follow developments in science and technology and undertake further studies in new and emerging technologies in civil engineering subject area and within broader or multidisciplinary contexts autonomously.	Identify and justify appropriate learning strategies and methods in independent lifelong learning to follow developments in science and technology and undertake further studies in new and emerging technologies in civil engineering subject area and within broader or multidisciplinary contexts.

TUNING Qualifications Reference Framework (Meta-Profile) of General Descriptors of a Master Programme in the Subject Area of PHYSICS (LEVEL 7)

QF EHEA 2nd cycle descriptors	SQF domain dimensions Level 7 (MASTER)	EQF descriptor Knowledge Level 7 *-Highly specialised knowledge, some of which is at the forefront of knowledge in a field of work or study, as the basis for original thinking and/or research* *-Critical awareness of knowledge issues in a field and at the interface between different fields*	EQF descriptor Skills Level 7 *- Specialised problem-solving skills required in research and/or innovation in order to develop new knowledge and procedures and to integrate knowledge from different fields*	EQF descriptor Autonomy and Responsibility (Wider Competences) Level 7 *- Manage and transform work or study contexts that are complex, unpredictable and require new strategic approaches* *- Take responsibility for contributing to professional knowledge and practice and/or for reviewing the strategic performance of teams*
I. *Have demonstrated knowledge and understanding that is founded upon and extends and/or enhances that typically associated with Bachelor's level, and that provides a basis or opportunity for originality in developing and/or applying ideas, often within a research context*	**1. Theories and models**	Describe the concepts, laws, models, theories and limitations of classical physics and those of at least one of the specialised cores of modern physics, as well as their application across a wide range of real-life situations and different disciplines.	Use concepts, laws and theories from different domains of physics to model, analyse and explain a wide range of physical phenomena and observations.	Identify relevant theories and models required to interpret phenomena, observations, and real-life situations, also in the context of a different discipline, integrating concepts from different domains of classical and modern physics and recognising the limitations of the different theories and models.
II. *Can apply their knowledge and understanding, and problem solving abilities in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their field of study*	**2. Mathematical methods**	Name and describe standard and advanced mathematical (analytical and numerical) tools and methods and their application in the context of physics theories.	Apply standard and advanced mathematical (analytical and numerical) tools and methods to solve problems in physics.	Identify, adapt, integrate and employ both standard and advanced mathematical (analytical and numerical) tools and methods to solve problems and model situations in a variety of contexts.
	3. Experimental design and scientific investigation	Describe standard and advanced experimental methods, instrumentation, techniques, theories and regulations used in experimental physics.	Design a complete physics experiment, using standard and advanced instrumentation safely and applying a wide range of methods, techniques and theories for data collection, analysis and reporting.	Set up and carry out scientific investigations independently and safely.
	4. Problem solving	Link concepts and laws from various domains of physics with advanced strategies, procedures, tools and criteria for framing, representing, solving and validating the results of a problem.	Categorise problems based on physical principles, including complex problems, context-rich problems, and problems derived from unfamiliar contexts; analyse a complex problem, recognise its structure and devise a creative plan for its solution, execute the devised plan and check for its validity.	Address complex problems and situations from the point of view of physics, identifying the laws and concepts that apply even in unfamiliar situations, devise and carry out a creative plan for reaching a solution and check its validity.
III. *Have the ability to integrate knowledge and handle complexity, and formulate judgements with incomplete or limited …*	**5. Scientific culture**	Recall focused historical and epistemological facts on the conceptual development of physics theories and relate them to changes and/or issues in technology, society, and the rules of the scientific community.	Select and use different sources of information on the history, epistemology and current development of physics, and analyse different examples also in relation to technological and societal issues.	Identify common ideas and approaches in different areas of science also in relation to its historical and epistemological evolution, and address scientific, technological and societal issues with an informed scientific, historical and epistemological approach.
	6. Work ethic and integrity	State general and specific ethical principles, norms, values, and standards relevant to the work of a physicist, and illustrate different examples when physics influences health, environment, politics and/or society.	Apply agreed ethical rules and rules of scientific conduct to behaviour in the profession.	Make decisions in line with ethical norms also in research environments and take responsibility for them, and actively contribute to local, national and international communities and (political) organisations according to own competence.
IV. *Can communicate their conclusions, and the knowledge and rationale underpinning these, to specialist and non-specialist audiences clearly and unambiguously*	**7. Communication**	Describe the different channels and tools of communication and their limitations.	Communicate effectively to present complex information in a concise manner orally and in writing and using ICT and technical language appropriate for the audience.	Evaluate scientific material and communicate it to a variety of audiences to inform, influence and debate using various techniques and technical language appropriate for the audience.
	8. Project Management and Teamwork	Describe different project management tools.	Engage productively in an individual or group project.	Identify and implement an appropriate strategy to carry out an articulated individual or group project, collaborate constructively, perform leading and/or supervisory functions when needed, and take responsibility for the assigned tasks.
V. *Have the learning skills to allow them to continue to study in a manner that may be largely self-directed or autonomous*	**9. Professional development**	Identify relevant competences needed for continuing academic/professional development, as well as personal strengths, weaknesses and attitudes.	Organise own study and/or learning process, using different kinds of learning materials; link personal strengths and weaknesses to learning goals and search for learning/career development opportunities.	Enter new fields/environments of study or work through a positive attitude, evaluate own personal and professional competences and take responsibility for continuing academic/professional development, also in unfamiliar contexts

Course Outcomes (CLOs)

- "Statements of observable student actions that serve as evidence of the Knowledge, Skills and Attitudes acquired in a course".
- Each course is designed to meet (about 6) Course Outcomes
- The Course Outcomes are stated in such a way that they can be actually measured.
- PLOs are attained through program specific Core Courses

Course Outcomes

Physics

CO1: Understand the knowledge of basic quantum mechanics, to set up one-dimensional Schrodinger's wave equations and its application to few physical problems.

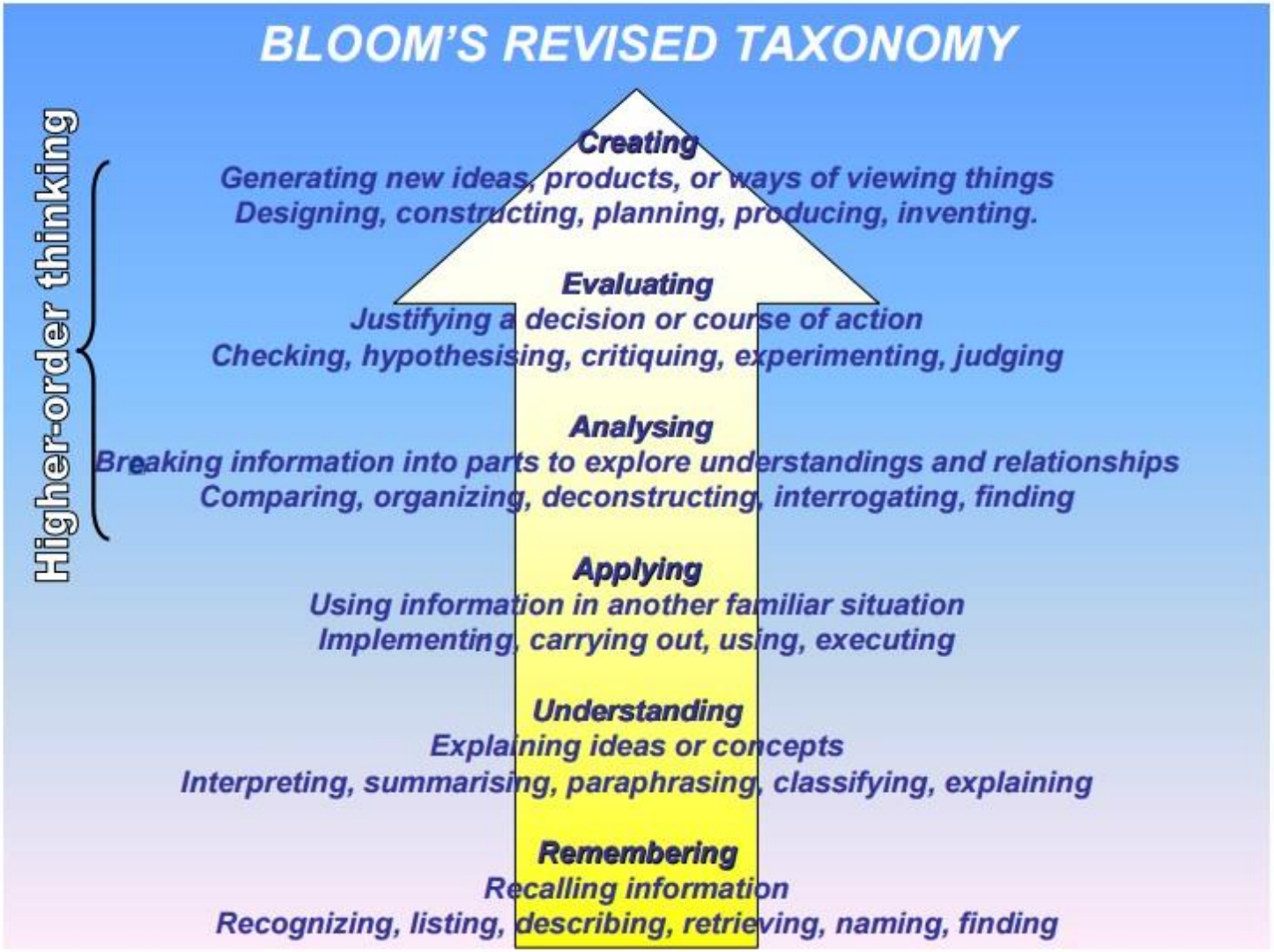
CO2: Understand the fundamental aspects of crystallography, able to recognize various planes in a crystal and have knowledge of structure determination using x-rays.

CO3: Understand the role of free electrons in determining the properties of metals, the concept of Fermi energy, and the domain formation in ferromagnetic materials.

CO4: Understand the basic laser physics, working of lasers, holography and principle of propagation of light in optical fibers.

CO5: Understand the theory of free, damped and forced vibrations of a particle and also the concept of resonance and its applications in ESR & NMR.

What level of BLOOM,s Taxonomy you want your students to achieve?



Retrieved from: http://www.kurwongbss.qld.edu.au/thinking/Bloom/blooms.htm

Comparison

Bloom's Levels	Program Outcomes	
Remember (K1)		
Understand (K2)		
Apply (K3)	Apply Knowledge	**Engineering Knowledge**: ***Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems***
Analyze (K4)	Problem Analysis	**Problem Analysis:** ***Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences***
Evaluate (K5)	Design/Development of Solutions	**Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.**

Structure of Course Outcomes:

Course Outcome statement may be broken down into two main components:

- **An action word** that identifies the performance to be demonstrated;
- **Learning statement** that specifies what learning will be demonstrated in the performance;

Examples of good action words to include in course outcome statements:

- Compile, identify, create, plan, revise, analyze, design, select, utilize, apply, demonstrate, prepare, use, compute, discuss, predict, assess, compare, rate, critique, outline, or evaluate

Course Title: Strength of Materials

Course Outcomes: Example

At the end of the course, student is able to:

Action Verb

1. **Apply** laws of physics (eg..Hook's law, etc.,) to compute different types of response (stress and deformation) in the given materials. (PO 1)

Learning Statement

2. **Analyse** structural elements for different force[illegible] compute design parameters (BM and SF) (PO2)
3. **Design** compression elements using engineering principles to resist any given loads. (PO3)
4. **Conduct** experiments to validate physical behaviour of materials/components.(PO4)
5. **Prepare** laboratory reports on interpretation of experimental results (P10)

STEP 1. LEARNING OUTCOMES

- TAKE THE PROGRAM LEARNING OUTCOMES (PLOs) OF THE DEGREE/MASTER YOU TEACH.
- TAKE OR DESCRIBE APPROPRIATELY THE COURSE/SUBJECT LEARNING OUTCOMES (CLOs).

STEP 2. ASSESSMENT PROCEDURE OF CLO

- TAKE THE PROGRAM LEARNING OUTCOMES OF THE DEGREE/MASTER YOU TEACH.
- TAKE OR DESCRIBE APPROPRIATELY THE COURSE/SUBJECT LEARNING OUTCOMES.

Procedure:

"specified way to perform a activity or process"

(ISO 9000: 2000)

We can define a evaluation procedure as the specification of tasks and / or activities to be carried out by the teacher and student in order to know and assess the student's level of competence.

Evaluation Procedure

LEARNING OUTCOMES:				
Assessment tasks	**Products / Actions**		**Evaluating person**	**Means, Techniques and tools of Evaluation**

Evaluation Procedure

Learning Outcomes: Prepare projects for technological development and / or initiation to scientific research.				
Assessment tasks		**Products / actions**	**Evaluating person**	**Means, Techniques and Tools of Evaluation**
a) Previous face-to-face tasks	-Attendance to theoretical classes -Reading basic documentation -Document reading: Guidance for carrying out work	- Response to objective tests where the conceptual domain on work methodology is made explicit	- Professor	- Objective Tests of Basic Knowledge of methodology
b) Non-contact tasks	-Selection of topic of interest -Selection of bibliography and documentation	-Description of the work topic -Bibliography listing	- Professor	- Bibliographic Selection checklist
	-Project elaboration draft 1 -Preparation of draft project 2 -Preparation of draft project 3	-Draft 1 of Project of the work -Draft 2 of Working Project -Draft 3 of Working Project	- Professor - student (Self appraisal)	- Assessment scale of Projects
	- Preparation of final project	- Draft	-Professor -- Students (Self-Assessment / Peer Assessment)	- Project valuation scales
c) Face-to-face task	- Oral presentation of the work project	-Presentation Script -Power Point presentation	-Professor -- Students (Self-assessment / Evaluation between equal)	- Assessment scale of the oral presentation of projects

Evaluation Procedure

Learning outcomes: Measure, interpret and design experiences in the laboratory or in the environment.				
Assessment tasks		**Products / actions**	**Evaluating person**	**Means, Techniques and Tools of Evaluation**
a) Previous face-to-face tasks	-Attendance to introductory classes -Reading practice scripts	- Response to objective tests where the conceptual domain on work methodology is made explicit	- Professor - student (Self appraisal)	- Basic knowledge of methodology tests
b) Non-contact tasks	-Reading practice scripts -Document reading: Guidelines for the realization of the practical reports	-Description of the work topic -Bibliography listing	- Professor - Professor - student (Self appraisal)	- Check list of memory sections - Assessment scale of Projects
	- Preparation of memory of practices	- Practice memories	-Professor	- - Rubric for memory assessment or written work.
c) Face-to-face task	- Carrying out the laboratory practice	-Presence registered --Delivery results / productions data -	-Professor	- Project rating scales

MEANS, TECNIQUES AND TOOLS FOR EVALUATION.

- Means: i.e. written essay, portfolios. It is a product of your activity as a student, the object of evaluation.
- I have to analyze it systematically, it will be my evaluation technique (through documentary analysis or productions if it is written, if it is oral through observation, or through interviews).
- The systematics for each of them are the techniques that you specify: evaluation instruments.

MEANS, TECNIQUES AND TOOLS FOR EVALUATION.

- Means of evaluation: Portfolios, written essay, lab notebook, concept map, objective test, lab notebook

- Evaluation techniques: observation, interview, essay analysis

- Tools: Checklist, assessment scale, semantic differential, rubric.

1st USEFUL ASSESSMENT TOOL
The checklist

- Isn't about quality—it's just about the parts that are necessary.
- Is a good indicator of "can do–can't do" and "done–not done".
- Defines the parts that make up a complete task (either product or process).
- Is useful for formative evaluation of a product or process.

Checklists: Use checklists to…

Record observed performance.

For example,

Activities Checklist		
Yes	No	Can name five sports.
Yes	No	Can name five activities other than sports.
Yes	No	Can create simple sentences about likes & dislikes regarding activities & sports.
Yes	No	Can ask a question about what others do in their free time.

Use checklists to…

Keep track of progress over time (e.g., as an inventory of skills at the beginning and end of a course). For example,

Receptive oral skills
❑ Understands simple directions.
❑ Understands simple sentences.
❑ Understands simple yes/no questions.
❑ Understands vocabulary appropriate to age.
❑ Understands meaning of different intonation patterns.
❑ Understands more complex directions.
❑ Understands rapid speech.
❑ Understands language in classroom situation.
❑ Understands language of peers.

Adapted from Genesee, F. & Upshur, J.A. (1996). *Classroom-based evaluation in second-language education*. Cambridge: Cambridge University Press, p. 88.

Use checklists to…

Indicate the minimum requirements of a product or performance, which are not included in your qualitative criteria (i.e., rubrics).

For example,

Essay - Non-negotiables		
Yes	No	My paper is typed, double-spaced.
Yes	No	I wrote at least 500 words.
Yes	No	My paper has an introduction, body, and conclusion.
Yes	No	I included examples from the story.
Yes	No	I proofread my paper.

Use checklists to…

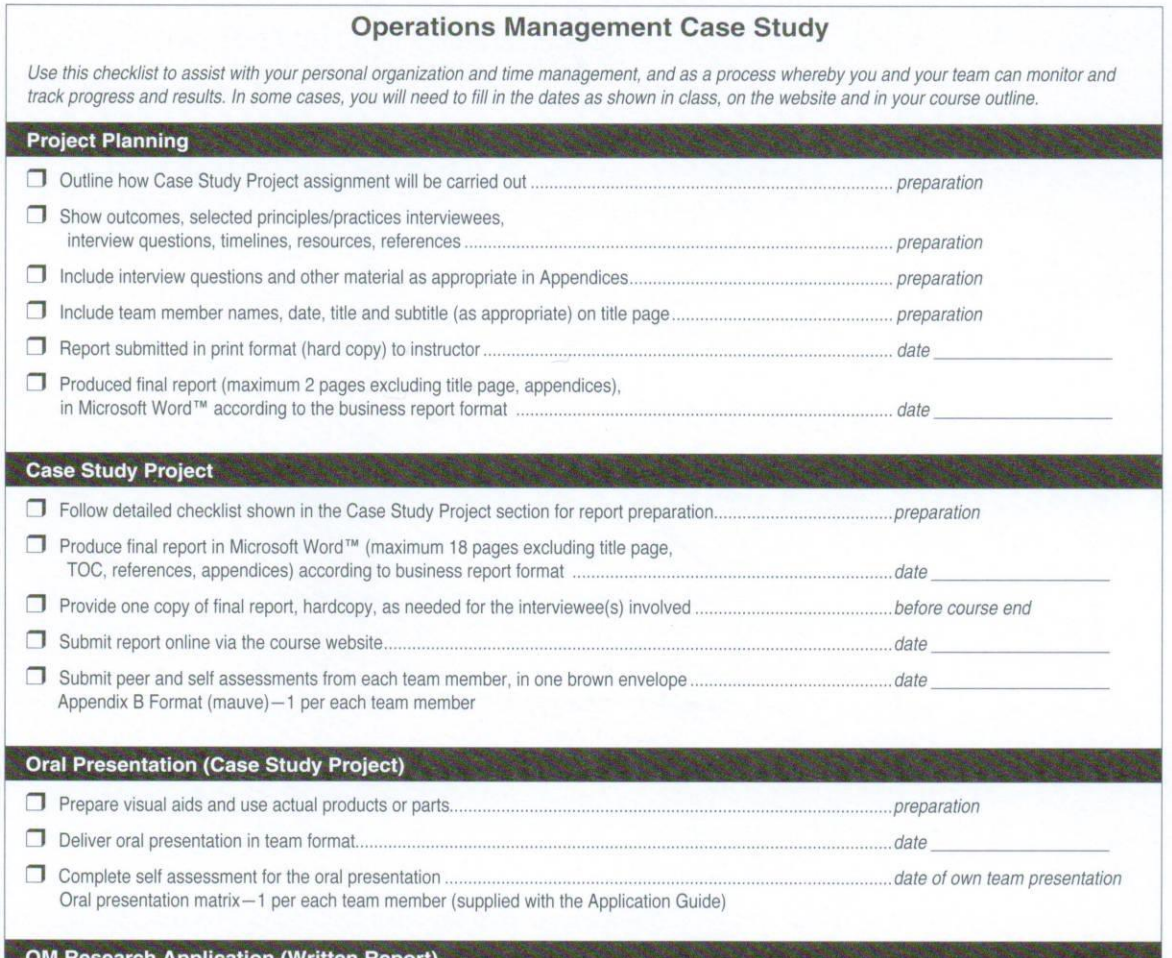
Help students fulfill task requirements.

For example,

Essay - Proofreading check - Draft 2	
	Length requirement
	Spell-checked
	Subject-verb agreement
	Noun-adjective agreement
	Verb conjugations

An example of a "process" checklist

For working in a team, giving a presentation, working to solve a problem, etc.



Operations Management Case Study

Use this checklist to assist with your personal organization and time management, and as a process whereby you and your team can monitor and track progress and results. In some cases, you will need to fill in the dates as shown in class, on the website and in your course outline.

Project Planning

- ❒ Outline how Case Study Project assignment will be carried out ..... *preparation*
- ❒ Show outcomes, selected principles/practices interviewees, interview questions, timelines, resources, references ..... *preparation*
- ❒ Include interview questions and other material as appropriate in Appendices ..... *preparation*
- ❒ Include team member names, date, title and subtitle (as appropriate) on title page ..... *preparation*
- ❒ Report submitted in print format (hard copy) to instructor ..... *date* _____
- ❒ Produced final report (maximum 2 pages excluding title page, appendices), in Microsoft Word™ according to the business report format ..... *date* _____

Case Study Project

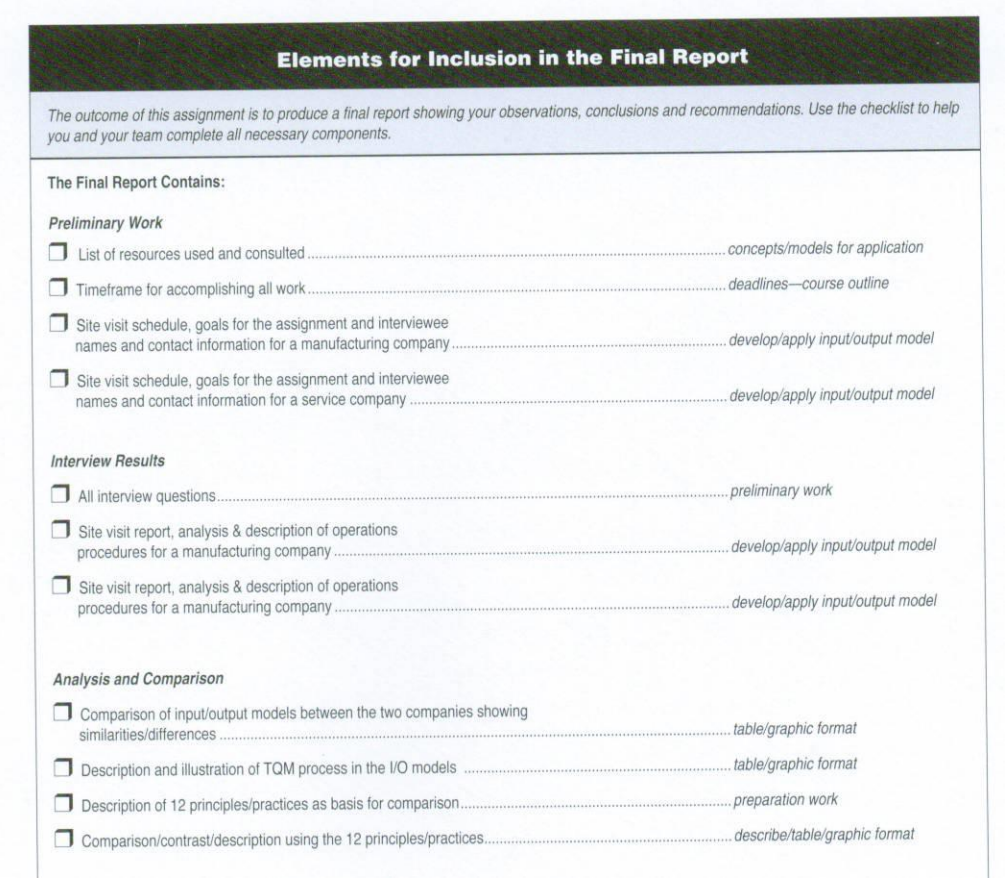
- ❒ Follow detailed checklist shown in the Case Study Project section for report preparation ..... *preparation*
- ❒ Produce final report in Microsoft Word™ (maximum 18 pages excluding title page, TOC, references, appendices) according to business report format ..... *date* _____
- ❒ Provide one copy of final report, hardcopy, as needed for the interviewee(s) involved ..... *before course end*
- ❒ Submit report online via the course website ..... *date* _____
- ❒ Submit peer and self assessments from each team member, in one brown envelope ..... *date* _____
  Appendix B Format (mauve)—1 per each team member

Oral Presentation (Case Study Project)

- ❒ Prepare visual aids and use actual products or parts ..... *preparation*
- ❒ Deliver oral presentation in team format ..... *date* _____
- ❒ Complete self assessment for the oral presentation ..... *date of own team presentation*
  Oral presentation matrix—1 per each team member (supplied with the Application Guide)

An example of a "product" checklist

For example, papers, portfolios, projects, solutions, etc.



Elements for Inclusion in the Final Report

The outcome of this assignment is to produce a final report showing your observations, conclusions and recommendations. Use the checklist to help you and your team complete all necessary components.

The Final Report Contains:

Preliminary Work

- ❒ List of resources used and consulted ..... *concepts/models for application*
- ❒ Timeframe for accomplishing all work ..... *deadlines—course outline*
- ❒ Site visit schedule, goals for the assignment and interviewee names and contact information for a manufacturing company ..... *develop/apply input/output model*
- ❒ Site visit schedule, goals for the assignment and interviewee names and contact information for a service company ..... *develop/apply input/output model*

Interview Results

- ❒ All interview questions ..... *preliminary work*
- ❒ Site visit report, analysis & description of operations procedures for a manufacturing company ..... *develop/apply input/output model*
- ❒ Site visit report, analysis & description of operations procedures for a manufacturing company ..... *develop/apply input/output model*

Analysis and Comparison

- ❒ Comparison of input/output models between the two companies showing similarities/differences ..... *table/graphic format*
- ❒ Description and illustration of TQM process in the I/O models ..... *table/graphic format*
- ❒ Description of 12 principles/practices as basis for comparison ..... *preparation work*
- ❒ Comparison/contrast/description using the 12 principles/practices ..... *describe/table/graphic format*

Advantages of checklists

- Easy to construct and use.
- Align closely with tasks.
- Effective for self and peer assessment.
- Make learners aware of task requirements, allowing them to self-monitor progress.
- Useful for sharing information with parents and others.
- Provides basic formative feedback.

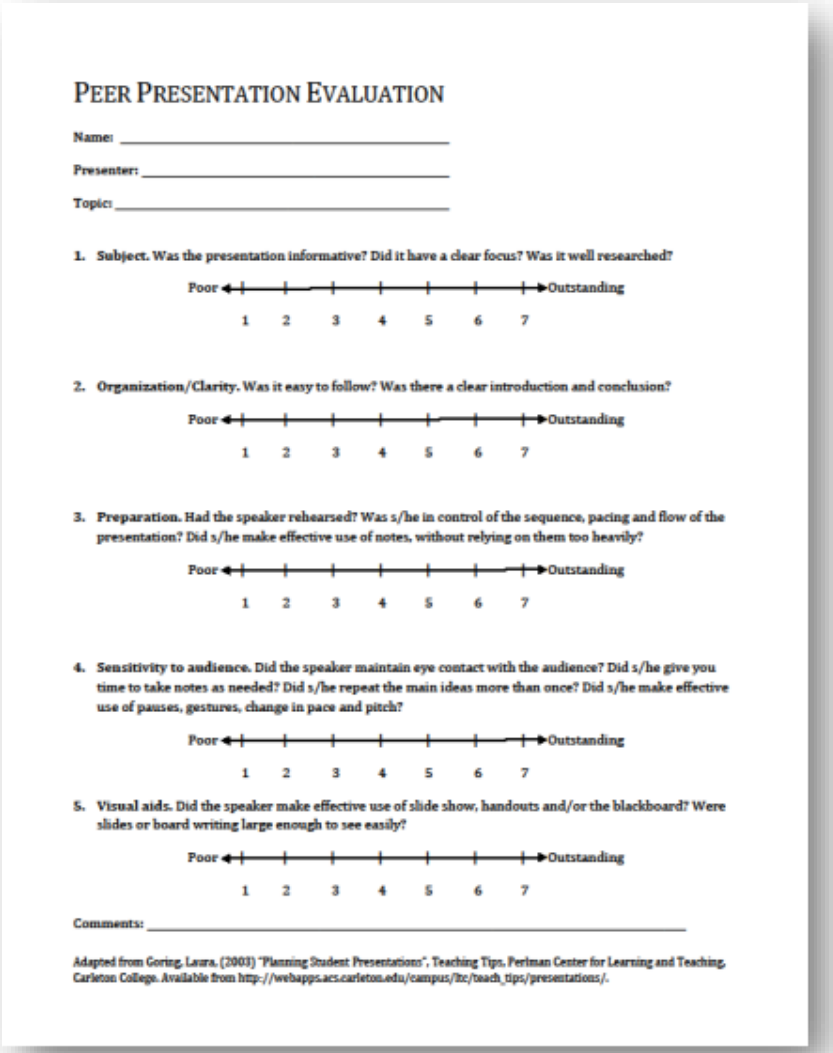
Disadvantages of checklists

- Provide limited information about how to improve performance or product.
- Do not indicate relative quality of performance or product.
- Do not provide information for assessing grades.

2nd USEFUL ASSESSMENT TOOL

Likert Scale: semantic differential

Is it time for vacation?



PEER PRESENTATION EVALUATION

Name: _____

Presenter: _____

Topic: _____

1. **Subject.** Was the presentation informative? Did it have a clear focus? Was it well researched?

Poor ◄—|—|—|—|—|—|—► Outstanding

1 2 3 4 5 6 7

2. **Organization/Clarity.** Was it easy to follow? Was there a clear introduction and conclusion?

Poor ◄—|—|—|—|—|—|—► Outstanding

1 2 3 4 5 6 7

3. **Preparation.** Had the speaker rehearsed? Was s/he in control of the sequence, pacing and flow of the presentation? Did s/he make effective use of notes, without relying on them too heavily?

Poor ◄—|—|—|—|—|—|—► Outstanding

1 2 3 4 5 6 7

4. **Sensitivity to audience.** Did the speaker maintain eye contact with the audience? Did s/he give you time to take notes as needed? Did s/he repeat the main ideas more than once? Did s/he make effective use of pauses, gestures, change in pace and pitch?

Poor ◄—|—|—|—|—|—|—► Outstanding

1 2 3 4 5 6 7

5. **Visual aids.** Did the speaker make effective use of slide show, handouts and/or the blackboard? Were slides or board writing large enough to see easily?

Poor ◄—|—|—|—|—|—|—► Outstanding

1 2 3 4 5 6 7

Comments: _____

Adapted from Goring, Laura. (2003) "Planning Student Presentations". Teaching Tips. Perlman Center for Learning and Teaching, Carleton College. Available from http://webapps.acs.carleton.edu/campus/ltc/teach_tips/presentations/.

3rd USEFUL ASSESSMENT TOOL

What are rubrics? RUBRICS

Rubrics are not a *form of assessment*, but are *the criteria* for making an assessment.

Are Tools to Evaluate Student Work

- Exams
- Presentation
  - Oral
  - Poster
- Written Assignment
  - Project/Report
  - Essay
  - Reflection
- Observations
- Art Pieces
- Resumes
- Portfolio

Rubrics

- A scoring scale used to assess student performance along a task-specific set of criteria
- Comprised of two components: criteria and levels of performance
- Some rubrics include descriptors: describe more precisely what performance looks like at each level

Criteria

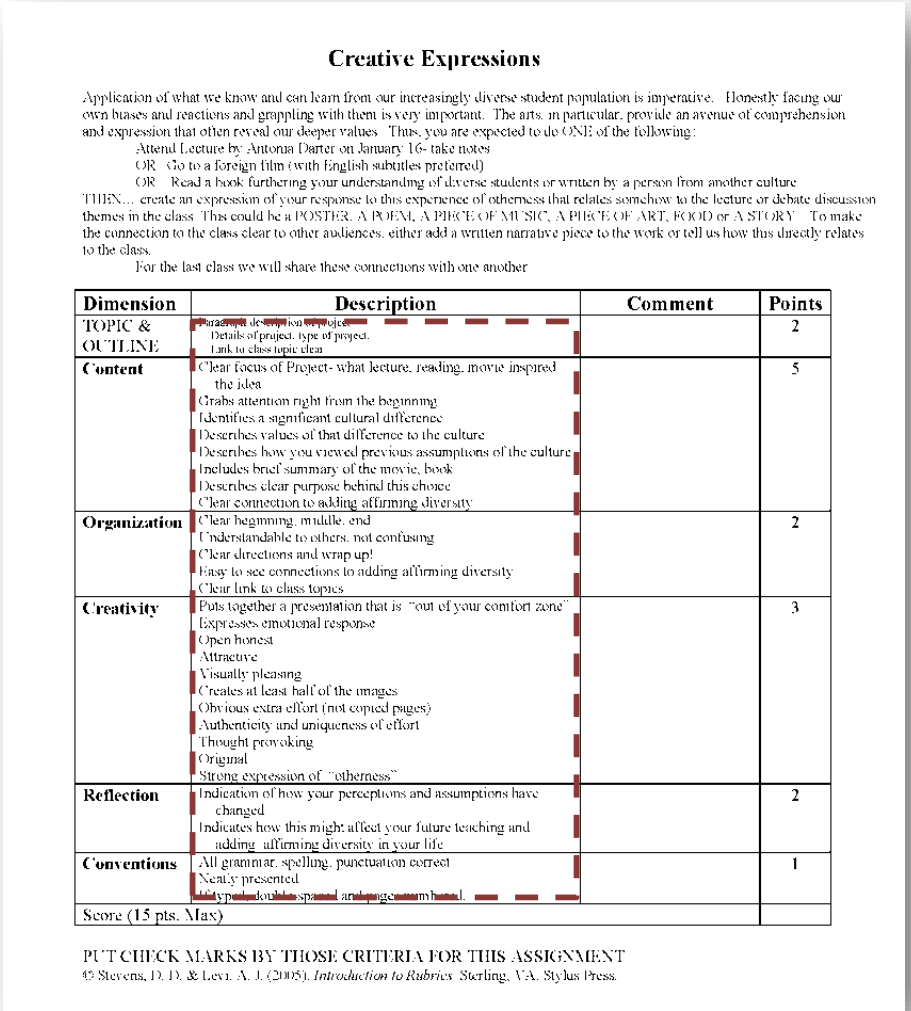
Level of performance

2. Written Communication Skills: Outcome a. The student writes standard English

	Level of Performance			
Criteria	**Exemplary (4)**	**Accomplished (3)**	**Developing (2)**	**Beginning (1)**
1.Idea and Content				
2. Organization / Structure				
3.Voice				

Holistic Rubric

Holistic or scoring guide rubrics assess student work as a whole



Creative Expressions

Application of what we know and can learn from our increasingly diverse student population is imperative. Honestly facing our own biases and reactions and grappling with them is very important. The arts, in particular, provide an avenue of comprehension and expression that often reveal our deeper values. Thus, you are expected to do ONE of the following:

Attend Lecture by Antonia Darter on January 16- take notes
OR Go to a foreign film (with English subtitles preferred)
OR Read a book furthering your understanding of diverse students or written by a person from another culture

THEN… create an expression of your response to this experience of otherness that relates somehow to the lecture or debate discussion themes in the class. This could be a POSTER, A POEM, A PIECE OF MUSIC, A PIECE OF ART, FOOD or A STORY. To make the connection to the class clear to other audiences, either add a written narrative piece to the work or tell us how this directly relates to the class.

For the last class we will share these connections with one another

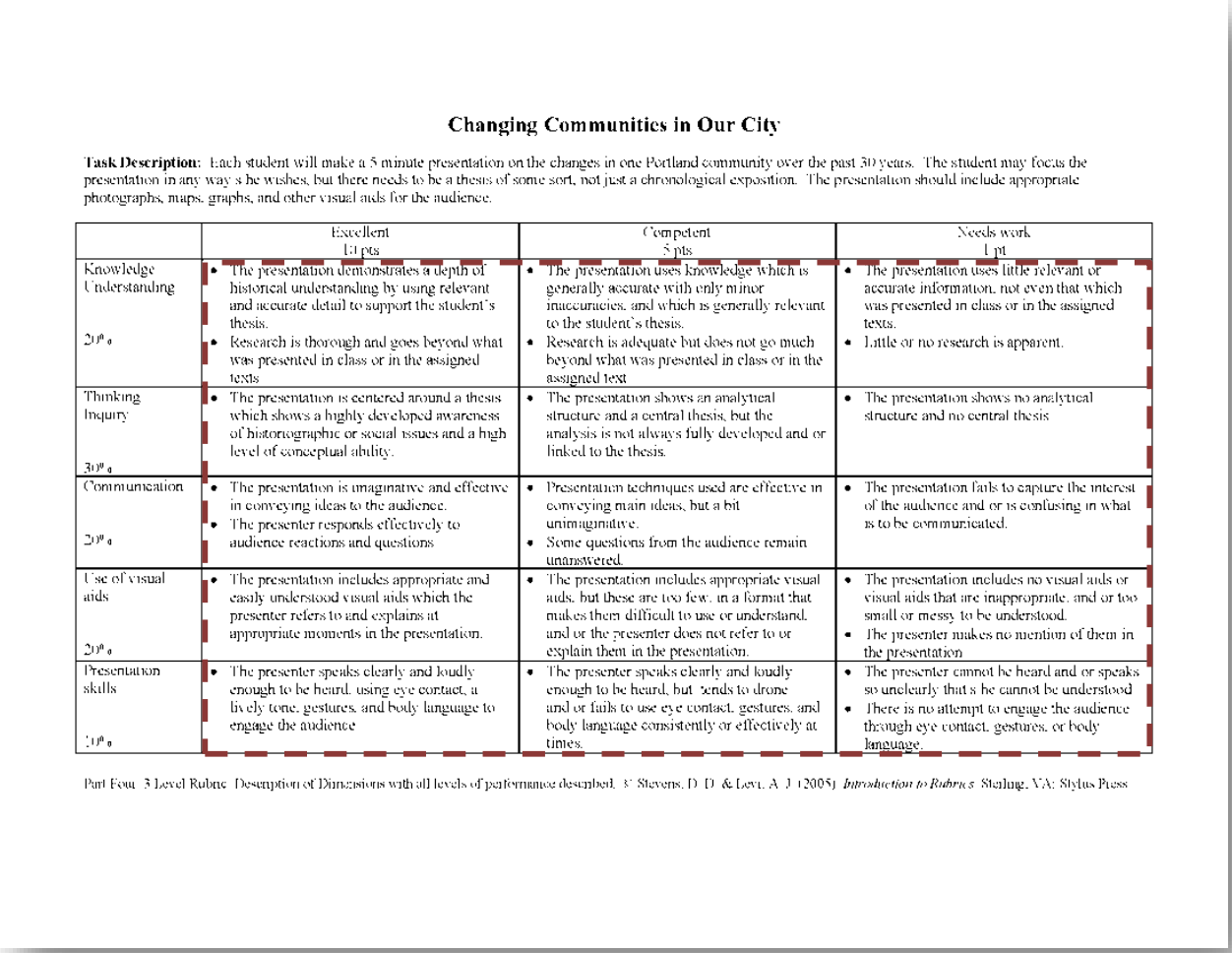
Dimension	Description	Comment	Points
TOPIC & OUTLINE	Paragraph description of project Details of project, type of project. Link to class topic clear		2
Content	Clear focus of Project- what lecture, reading, movie inspired the idea Grabs attention right from the beginning Identifies a significant cultural difference Describes values of that difference to the culture Describes how you viewed previous assumptions of the culture Includes brief summary of the movie, book Describes clear purpose behind this choice Clear connection to adding affirming diversity		5
Organization	Clear beginning, middle, end Understandable to others, not confusing Clear directions and wrap up! Easy to see connections to adding affirming diversity Clear link to class topics		2
Creativity	Puts together a presentation that is "out of your comfort zone" Expresses emotional response Open honest Attractive Visually pleasing Creates at least half of the images Obvious extra effort (not copied pages) Authenticity and uniqueness of effort Thought provoking Original Strong expression of "otherness"		3
Reflection	Indication of how your perceptions and assumptions have changed Indicates how this might affect your future teaching and adding affirming diversity in your life		2
Conventions	All grammar, spelling, punctuation correct Neatly presented [illegible] spaced and page [illegible]		1
Score (15 pts. Max)			

PUT CHECK MARKS BY THOSE CRITERIA FOR THIS ASSIGNMENT

© Stevens, D. D. & Levi, A. J. (2005). *Introduction to Rubrics*. Sterling, VA: Stylus Press.

Analytic Rubric

Analytic rubrics identify and assess components of a finished product



Changing Communities in Our City

Task Description: Each student will make a 5 minute presentation on the changes in one Portland community over the past 30 years. The student may focus the presentation in any way s he wishes, but there needs to be a thesis of some sort, not just a chronological exposition. The presentation should include appropriate photographs, maps, graphs, and other visual aids for the audience.

	Excellent 10 pts	Competent 5 pts	Needs work 1 pt
Knowledge Understanding 20%	• The presentation demonstrates a depth of historical understanding by using relevant and accurate detail to support the student's thesis. • Research is thorough and goes beyond what was presented in class or in the assigned texts	• The presentation uses knowledge which is generally accurate with only minor inaccuracies, and which is generally relevant to the student's thesis. • Research is adequate but does not go much beyond what was presented in class or in the assigned text	• The presentation uses little relevant or accurate information, not even that which was presented in class or in the assigned texts. • Little or no research is apparent.
Thinking Inquiry 30%	• The presentation is centered around a thesis which shows a highly developed awareness of historiographic or social issues and a high level of conceptual ability.	• The presentation shows an analytical structure and a central thesis, but the analysis is not always fully developed and or linked to the thesis.	• The presentation shows no analytical structure and no central thesis
Communication 20%	• The presentation is imaginative and effective in conveying ideas to the audience. • The presenter responds effectively to audience reactions and questions	• Presentation techniques used are effective in conveying main ideas, but a bit unimaginative. • Some questions from the audience remain unanswered.	• The presentation fails to capture the interest of the audience and or is confusing in what is to be communicated.
Use of visual aids 20%	• The presentation includes appropriate and easily understood visual aids which the presenter refers to and explains at appropriate moments in the presentation.	• The presentation includes appropriate visual aids, but these are too few, in a format that makes them difficult to use or understand, and or the presenter does not refer to or explain them in the presentation.	• The presentation includes no visual aids or visual aids that are inappropriate, and or too small or messy to be understood. • The presenter makes no mention of them in the presentation
Presentation skills 20%	• The presenter speaks clearly and loudly enough to be heard, using eye contact, a lively tone, gestures, and body language to engage the audience	• The presenter speaks clearly and loudly enough to be heard, but tends to drone and or fails to use eye contact, gestures, and body language consistently or effectively at times.	• The presenter cannot be heard and or speaks so unclearly that s he cannot be understood • There is no attempt to engage the audience through eye contact, gestures, or body language

Part Four: 3 Level Rubric. Description of Dimensions with all levels of performance described. (C. Stevens, D. D. & Levi, A. J. (2005). *Introduction to Rubrics*. Sterling, VA: Stylus Press.

Criteria

Descriptors

Level of performance

2. Written Communication Skills: Learning Outcome

	Level of Performance			
Criteria	**Exemplary (4)**	**Accomplished (3)**	**Developing (2)**	**Beginning (1)**
1.Idea and Content	Writes clearly and with focus; relevant details support the central theme.	Maintains clear focus throughout the paper with sufficient appropriate details indicating awareness, knowledge, and insight.	Partially focuses on topic with minimal or no support of position. Writing is basic, too general for the reader to develop a clear understanding.	Writes with unclear purpose or central theme. Does not clearly define or support position on topic. Uses limited or disconnected details that disrupt the unity of the paper.
2. Organization / Structure	Provides clear introduction and reinforcing conclusion. Orders writing logically with effective transitions, providing sufficient information in the appropriate places.	Supports thesis and purpose through organization and paragraphing; most transitions are appropriate, but sequence of ideas may need improvement. Reiterates introductory elements in conclusion.	Writes with some signs of logical organization; may include abrupt or illogical shifts and ineffective flow of ideas. Makes few transitions between ideas.	Writes with organization that is unclear or inappropriate to the thesis; lacks transitions between ideas.
3.Voice	Writes expressing own personality, with confidence and feeling. Individual, powerful commitment to the topic is obvious, as are strong connections to the audience and to the purpose; evokes strong emotion in the reader.	Writes so that own personality pokes through; confidence and feeling fade in and out. Commitment to the topic is apparent, and connection to the audience and to the topic are appropriate. The writing evokes some emotion in the reader.	Writes without revealing own personality; writing is cautious. Commitment to topic, and connection to the audience and to the purpose are limited. Writing evokes limited emotion in reader.	Writes without personality. Shows lack of commitment to topic, connection to the audience and to the purpose. Evokes no emotion in reader.

Possible terms for level of performance

4	3	2	1
Exemplary	Accomplished	Developing	Beginning
Professional	Experienced	Developing	Novice
Frequently	Sometimes	Rarely	Never
Distinguished	Proficient	Apprentice	Novice
Exemplary	Excellent	Acceptable	Unacceptable
Exceeds expectations	Meets expectations	Progressing	Beginning
Superior	Good	Fair	Needs work

Adjectives and Adverbs for Descriptors

Exemplary	Proficient	Progressing	Beginning / Not Meeting Expectations
All	More than ___ (or most)	Fewer than ___ (or some)	None (or very few)
Always	Often, usually	Seldom, rarely, sometimes	Never, not at all
Complete	Somewhat complete	Less than complete	Incomplete
Superior	Adequate	Less than adequate	Inadequate
Maximum	Satisfactory	Minimal	Unsatisfactory
Articulate	Understandable	Vague	Unclear
Clear, accurate	Often clear, often accurate	Sometimes unclear/inaccurate	Rarely clear
…to the highest level	…to an acceptable level	…to a minimal level	…to an unacceptable level
Includes all elements of…	Includes most elements of…	Includes few elements of…	Includes no elements of…
Clear	Somewhat proper	Sometimes improper	Improper
Proper	Some degree of clarity	Somewhat unclear	Unclear
Appropriate	Somewhat appropriate	Limited	Inappropriate
All Necessary…	Adequate number of…	Minimal amount of…	Lacks enough of…
Significant	Important	Somewhat relevant	Inconsequential, Unimportant
Critical, crucial	Essential	Somewhat useful	Unnecessary
Logical, rational	Reasonable	Somewhat reasonable	Illogical
Intuitive	Somewhat intuitive	Somewhat instinctive	Random

EXAMPLES OF Rubrics

Advantages: provides

- Clearer expectations
- More consistent and objective assessment
- Better feedback

Media Literacy Reporting

Student: _____
Date: _____

outstanding = 5
very good = 4
satisfactory = 3
unsatisfactory / not possible to evaluate = 1

Outcome: To engage students in the process of educating themselves, and one another, about current developments in these areas of the media literacy movement, using the Internet as a source.

Provides an insightful comparison of two or more organizations or initiatives.	**2**	**6**	**8**	**10**
Focuses on mission/goals/purpose/funding and approaches/strategies.	1	3	4	5
Presents in a coherent, articulate and systematic manner.	1	3	4	5
Provides necessary context and background for audience to understand presentation.	1	3	4	5
Uses visual aids (e.g., Internet or Powerpoint projections, other) in presentations.	1	3	4	5
Presents oral information in an engaging and rehearsed manner.	1	3	4	5
Stays within 10-15 minute presentation time-frame.	1	3	4	5
Is overall a creative and original presentation.	1	3	4	5
Pays attention overall to detail.	1	3	4	5

Comments:

Total: / 50

Sample Analytic Rubric: Oral Presentation

Breakfast in Bed: Holistic Rubric

	Below Expectation	Satisfactory	Exemplary
Organization	-No apparent organization -Evidence not used to support assertions	-Presentation has a focus -Student provides evidence that supports conclusions	-Presentation is carefully organized. -Speaker provides convincing evidence to support conclusions
Content	-Content is inaccurate or overly general -Listeners are unlikely to learn or may be misled	-Content is generally accurate, but incomplete -Listeners may learn isolated facts but are unlikely to gain new insights about topic	-Content is accurate and complete -Listeners are likely to gain new insights about the topic.
Delivery	-Speaker appears anxious and uncomfortable -Speaker reads notes rather than speaking -Listeners are largely ignored	-Speaker is fairly relaxed and comfortable -Speaker too often relies on notes -Listeners are sometimes ignored or misunderstood.	-Speaker is relaxed and comfortable -Speaker speaks without undue reliance on notes -Speaker interacts effectively with listeners.

Physics Presentation Rubric

	4	3	2	1
Organization	Student presents information in logical, interesting sequence which audience can follow.	Student presents information in logical sequence which audience can follow.	Audience has difficulty following presentation because student jumps around.	Audience cannot understand presentation because there is no sequence of information.
Subject Knowledge	Student demonstrates full knowledge (more than required) by explaining and elaborating on the given topic.	Student demonstrates knowledge by explaining the given topic well.	Student is uncomfortable with information and explanations are incomplete or hard to grasp.	Student does not have grasp of information.
Presentation (PowerPoint)	Student's slides explain and reinforce the presentation. Background and text have been carefully planned to enhance readability and content.	Student's slides relate to the presentation. Background and text enhance the content and are easy to read for most of the presentation.	Student's slides rarely support the presentation. Background and text are distracting and are difficult to read for most of the presentation.	Student's slides do not support the presentation. Background and text are distracting and illegible.
Accuracy	All content throughout the presentation is accurate. There are no errors or mistakes in the presentation.	Presentation has no more than two errors, mistakes, or inaccuracies.	Presentation has three or four errors, mistakes, or inaccuracies.	Student's presentation has five or more errors, mistakes, or inaccuracies.
Eye Contact	Student maintains eye contact with audience, seldom returning to notes.	Student maintains eye contact most of the time, but frequently returns to notes.	Student occasionally uses eye contact, but still reads most of the report.	Student reads all of report with no eye contact.
Voice	Student uses clear voice and correct, precise pronunciation of terms so that all audience members can hear presentation.	Student's voice is clear. Student pronounces most words correctly. Most audience members can hear presentation.	Student's voice is low. Student incorrectly pronounces terms. Audience members have difficulty hearing presentation.	Student mumbles, incorrectly pronounces terms, and speaks too quietly for audience to hear.

Presentation Title:_____ Evaluator:_____

Presenter:_____ Date:_____

Characteristics	5	4	3	0
Content (Weighting x 2)	•Content was highly appropriate for the course assignment or outside presenter's goals •No content errors •Well articulated ideas that are supported by evidence •Clearly differentiates between fact, theory and inference •Answers all questions clearly and completely •Uses a variety of appropriate citations.	•Content was mostly appropriate for the course assignment or outside presenter's goals •No significant content errors •Most ideas are well articulated and supported by evidence •Often differentiates between fact, theory and inference •Answers nearly all questions clearly and completely •Uses appropriate citations.	•Content was somewhat appropriate for the course assignment or outside presenter's goals •A few significant content errors but general ideas correct •Few ideas are well articulated, few are supported by evidence •Often confuses fact, theory and inference •Has trouble answering questions •No appropriate citations.	Unacceptable
Planning and Preparation	•Manages time well, presentation ends at the scheduled time •Smooth transitions, ideas and slides flow effectively, topic presented in a logical order •Highly appropriate topic and level for the audience •Little or no use of technical jargon, all technical words appropriately defined •All visual/audio aids relevant to topic or support the presentation •Visual/audio aids are complete, easy to understand, and easy to see/hear	•Manages time fairly well, presentation ends close to the scheduled time •Most transitions smooth, ideas and slides flow reasonably well, presentation fairly easy to follow •Somewhat appropriate topic and level for the audience •Some technical jargon, all technical words defined •Most visual/audio aids relevant to topic or support the presentation •Visual/audio aids are somewhat easy to understand and see/hear	•Presentation ends about 20% too soon or too late •Choppy transitions, ideas and slides flow, presentation difficult to follow •Topic and difficulty level too simple or complex for most of the audience •A lot of technical jargon, a few technical words defined •Most visual/audio aids not relevant to topic OR most visual/audio aids missing •Visual/audio aids are difficult to understand and see/hear	Unacceptable
Delivery	•Generated and maintained significant interest in the topic throughout presentation •Nearly continual use of direct eye contact, seldom looks at notes •Displays relaxed, self-confident nature about self, with no mistakes •Correct, precise pronunciation of terms, all audience members can hear presentation.	•Generated and maintained some interest in the topic throughout presentation •Consistent use of direct eye contact with audience, often returns to notes •Makes minor mistakes, but quickly recovers; displays little or no tension •Most words pronounced correctly, most audience members can hear presentation	•Generated and maintained little interest in the topic throughout presentation •Minimal eye contact with audience, mostly reading from the notes •Tension and nervousness is obvious; has trouble recovering from mistakes •Many incorrectly pronounced words, many audience members have difficulty hearing presentation	Unacceptable

Note: if any section is Unacceptable, then the entire presentation gets a zero.

Additional comments about the presentation:

What did you learn from this presentation? Write a short paragraph.

Circle one

Acceptable Total = /20

Unacceptable Total = 0

Classroom Environment – How to use the rubric effectively?

- Provide student with copy of rubric
- Review rubric with students prior to assignment being submitted

- Student submit the work

- Use rubric to grade/assess work
- Provide students with feedback directly on rubric so that they can see there performance level

YOU REALLY need a rubric

EXERCISE

FILL IN THREE TABLES

DO NOT BE AFRAID!

IT IS EASY

WRITE TASKS AND PRODUCTS to be evaluated

Evaluation Procedure

LEARNING OUTCOME:				
Assessment tasks	**Products / Actions**		**Evaluating person**	**TOOL FOR EVALUATION**
				RUBRIC

RUBRIC (ANALYTIC RUBRIC)

GRADING KEY	
A	3.7 – 4.0
B	2.7 – 3.6
C	1.7 – 2.6
D	1 – 1.6
F	0

Title

PRODUCT:

	EXCELLENT 4	ABOVE AVERAGE 3	AVERAGE 2	BELOW AVERAGE 0-1	Score
Connections to Experience					
Connections to Discipline					
Transfer					
Integrated Communication					
Reflection and Self-Assessment					

USEFUL RESOURCES

Rubric norming

- To produce reliable scores, faculty members need to be interpreting the rubric in the same way.
- Provide an opportunity for faculty to practice rating student work using the rubric and discussing scores and discrepancies. Allow raters to explain their judgments, and attempt to arrive at consensus about the most appropriate rating in each case.
- Once the group is satisfied with how the rubric is to be applied, rating can begin and reviews can begin scoring.
- Present a summary of scores to the group. Discuss results as well as the effectiveness of the process itself.

Resources

- https://www.cpp.edu/~academic-programs/program-review/assessment-student-learning/rubrics.shtml
- http://woodard.latech.edu/~kklopez/EDCI489CReadWriteThinkWeb/podcastrubric.html
- http://manoa.hawaii.edu/assessment/howto/rubrics.htm#p4
- https://www.aacu.org/value-rubrics

Online Rubric Tools

iRubric

www.irubric.com

Rubistar

rubistar.4teachers.org

Moodle 2.0

http://docs.moodle.org/23/en/Rubrics

Rubric building websites

Rubric Builders and Generators	
The Canadian Teacher: www.thecanadianteacher.com/tools/assessment	Tools to create a variety of assessments for student work
MyTL4:http://myt4l.com/index.php?v=pl&page_ac=view&type=tools&tool=rubric maker	Make customized assessments for student work
NCRtec: http://goal.learningpt.org/spsg/GetProd.asp	Create customized rubrics for student work
PBL Checklists: http://pblchecklist.4teachers.org/checklist.shtml	Create checklists for writing, science, oral presentations and multimedia
RubiStar: http://rubistar.4teachers.org/index.php	An online tool to develop scoring guides
Rubric Builder: http://landmark-project.com/rubric_builder/index.php	Create scoring guides online
Rubric Generator: http://www.teach-nology.com/web_tools/rubrics/	Personalize ready made scoring guides or create your own
Rubric Studio: http://www.rcampus.com/indexrubric.cfm	Create a rubric or select from already created rubrics
Subject Specific and General Rubrics	
Rubrics 4 Teachers: http://www.rubrics4teachers.com/	Educational rubrics created and ready to use
Teacher Helpers Assessment and Rubric Information: http://school.discoveryeducation.com/schrockguide/assess.html	A variety of subject specific assessment rubrics
Rubric Construction Kit	
Assessment Rubrics: http://edtech.kennesaw.edu/intech/rubrics.htm	Criteria for creating rubrics
Atomic Learning: http://movies.atomiclearning.com/k12/la_rubrics_wd03	Directions for creating a rubric in MS Word
2Learn: http://www.2learn.ca/projects/together/START/rubricc.html	Planning worksheet and generator
Rubric Checklist: http://www.ncsu.edu/midlink/rubrics/Rubric.Checklist.ELS.11.00.doc	Helpful guide for constructing an effective rubric
Rubric Template: http://its.leesummit.k12.mo.us/Rubric%20Template%207.00.xls	An Excel template for creating your own rubrics
Rubric Vocabulary: http://www.ncsu.edu/midlink/rubrics/Rubric%20Words.doc	Aids for defining rubric dimensions

Additional References

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Schreyer Institute for Teaching Effectiveness (2007). "The Basics of Rubrics." Penn State University. www.schreyerinstitute.psu.edu

Suskie, L. (2009). *Assessing Student Learning: A Common Sense Guide*. San Francisco: Jossey-Bass.

Taggart, G.L., Phifer, S.J., Nixon, J. A., and Wood, M. , eds. (1998). *Rubrics: Handbook for Construction and Use*. Lancaster, PA: Technomic Publishing Co.

University of Hawai'i at Manoa, n.d. "Developing a Rubric." http://manoa.hawaii.edu/assessment/resources/index.htm.

→Steal good ideas!

The End

Q & A