

## COMPETENCES TRAINING. FROM DESIGN TO DEVELOPMENT AND EVALUATION OF TEACHING

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**Abstract:** *The aims of education evolved from the knowledge towards the goals (instructive - educational), from here in the objectives area and the last two - three decades in the area of skills training. From the perspective of didactics, the essential movement is the type of desired end – skills instead of content. For skills training a rethinking of the whole teaching approach is needed, from design to the actual pursuit of teaching and the type of assessment. In this paper, we propose a systemic approach to design, conduct, evaluation of teaching, focusing on skills training through concrete examples.*

**Keywords:** *competences training, cognitive constructivist perspective, learning for life, design, development, evaluation of teaching;*

### Introduction

The aims of education evolved from the knowledge toward the goals (instructive - educational), and from here towards the objectives area and the last two - three decades in the area of skills training.

In the traditional view learning means recording, storage and reproduction of knowledge, which the teacher considers necessary for general education and less professional (expert). Thinking and acting students are targeted, rigorously conducted externally through lecture-type activities, followed by reproductive exercises. Research and discovery are missing, and experience the daily life of students and concrete are ignored.

Student centered learning derived from the constructivist theory of learning, where learning is a process in which the individual is "built" new basis of previously accumulated knowledge and practical experience. By drawing lessons students can develop their own mental models or schemes to define concepts and their correlation in new structures. Such knowledge is no longer independent student and are not passively received. The student-centered environment are generated active processes, information processing, building hypotheses, decision making, using their own mental models.

Moreover, social constructivism, improving knowledge emphasizes the role of teachers, parents, peers, the community at large for individual acquisition of knowledge, in their capacity as guardians or mentors.

Focus on skills training complying with the three components of competence: the transmission of knowledge (what the student should know), the formation of working activities (what the student should do with what he knows) and the formation of positive attitudes, optimistic towards himself and towards the others to grow personally and professionally in this world.

To meet the needs of the child today, the training process by formulating problems needs to be rethought in connection with new technologies. Virtual tools, educational software can be used to simulate processes, phenomena, real-world experiences that the child can explore the school, the learning activity. Children can watch experiments ready made or can make their own experiments under the guidance of the teacher to answer their own questions in terms of academic knowledge that a teacher proposes.

The two directions: focusing on skills and the need to access the new technologies need to support each other.

### **1. Conceptual distinction**

The competences are the integrated ensemble of skills and capabilities, operation and transfer of procurement, enabling the efficient conduct of activities in functional use of knowledge and skills in different formal, non-formal and informal contexts

From the perspective of didactics, the essential mutation consists in the type of desired end - skills instead of content.

In the context of competence-based training, education components have a certain qualitative change by repositioning aims from two different perspectives: the key skills and competencies of school curriculum. Competency-based training has in mind interdisciplinary approach to learning by infusing content from several school subjects and to real situations, both in the educational process analysis, and to design training.

For skills training is needed rethinking the whole teaching approach from design, to conduct itself in the manner of teaching and assessment.

The design of the learning units, unfolding school activities focused on the operation, applying practical contexts of the new acquisitions, the integration of interdisciplinary knowledge into existing systems, are steps leading to the formation of competencies, and the acquisition of knowledge becomes a result of operating, not a result of a process dominated by memory.

Such theoretical acquisitions will be the result of a well-conducted exercise, not the result of an act of memorizing.

Competence-based learning leads to learning objectives with a high complex level. Children learn to make decisions, solve problems, think critically, choose effective methods and techniques.

Analyzing in terms of the role that the student has in teaching, constructivism is the way that leads to competence as personal acquisition.

Constructivism the process defined by the student-centered education principles and focuses on the interpretation of stimuli that occur in student's mind. The students is no longer seen as a container passively absorbing information, knowledge is not transmitted by simply reading or listening, but by personal significance that the student pays to educational stimuli. Students actively develop new knowledge through interactions with the environment. Therefore, anything he reads, sees, hears or feels is analyzed from the perspective of mental existing constructs / prior knowledge, developing and strengthening old structures of knowledge if they can be applied to larger environment structures or modifying the old ones when new information produce a state of imbalance. Learning is seen as an active process and social construction of meanings and meanings systems based on sensory stimuli and it is greatly influenced by the language. (Joița, 2006)

Constructivist communication environments are defined by the following characteristics:

- provide multiple representations of reality;
- avoid excessive simplification and represent the complexity of the living world;
- focus on authentic applications in meaningful contexts;
- provide natural learning environments and based on concrete cases;
- encourage critical reflection on experience;
- allow construction of knowledge based on content or context;
- allow collaborative knowledge building.

Constructionism is a theory which states that learning is more effective when the student builds something in order to convey meaning to others that he has delivered to a work (by mere assertions or more elaborate compositions). Mere reading is not sufficient to cause learning, but an effort to explain in their own words an idea to another person or to make a plea would

lead to a better understanding of the teaching load, which is integrated more consistently in his own ideas. This is the explanation given by this theory that people take notes during a lecture although they do not intend to read them later.

Social Constructivism is a current focused on the construction of meaning by the members of social groups, building a collaborative culture in miniature joint product with common meanings. The participation in such groups generates learning situations. The activities and products manufactured within a group as a whole help shape the behavior of members within the group.

Learning in small groups therefore, mutual learning are ways of organizing learning in light of these theories.

Cognitivism highlights the internal processes of learning. For cognitive student is an active information processing. So learning is characterized by a change in the student's mental structures.

Educational vision arising from cognitive approach emphasizes the active mental engagement of students throughout the learning to manage in-depth information processing.

Cognitive constructivist learning involves permanent student involvement in building their own learning by harnessing its experience and reintegration of new acquisitions in existing systems.

## **2. Teaching design from a cognitive constructivist perspective**

In the case of focusing on skills training, their main concern is the transfer of documents regulating the curriculum applied in education. Our paper aims to present how teachers can conceive the design and assessment tests in agreement with the skills to be targeted.

The design will be done through a document with this structure, Table1.

Table 1. Structure of the teaching design (Popa, 2009)

<b>Content detailing</b>	<b>Reference objectives / Specific skills</b>	<b>Learning Activities</b>	<b>Resources</b>	<b>Evaluation</b>
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### **2.1. Content detailing**

In this box appear content specifications necessary for the explanation of certain pathways, that is, information that the student must practice to become knowledge that can operate. For example, in maths class IV, content addition and subtraction with natural numbers without crossing order, we will note down: *amount, total term, the higher, was added, etc.*

This box is what keeps us "In the context of the curriculum and do not let us overcome the notions quantity, information that we claim to students at the same time do not let us "forget" certain knowledge that students are required to have.

Reference objectives /Specific skills

In this box are written those reference objectives/ specific skills listed in the annual planning, in the learning unit plan.

### **2.2. Learning activities**

In this section are written activities that students do. Suggested activities can be used for curriculum, supplemented, modified, or even replaced with others that the teacher thinks are appropriate for practicing skills. To identify the most appropriate learning activities to a certain level, we use Bloom's Taxonomy.

Important! For each of the six levels of Bloom's taxonomy some learning activities are required. We begin a unit with verbs derived from the first level knowledge and continue with understanding, application, analysis, synthesis, argumentation.

Note: For each learning activity it is recommended a line, in table.

### **2.3. Resources**

In this section, are written material resources and proceedings, teacher's, material provided to students. Examples: Exercise 5, p.65 textbook, worksheet, Annex 2, [http://chemistry.dortikum.net/download/chemistry\\_setup\\_en.exe](http://chemistry.dortikum.net/download/chemistry_setup_en.exe)), the way of organizing the activity: frontal, individual, group, pairs.

It is necessary to have specified document design exercises, concretely, to be his accompanying worksheets.

This section offers „a picture" of what happens in the classroom at a certain time. There are described specifically, for each of the learning conditions in which learning occurs.

For each learning activity, it is specified the learning conditions.

#### **2.4. Evaluation**

Under this heading is given for each learning activity assessment methods used in the classroom during learning activities, to follow how well it was done the task and implicitly the learning, what is the students' progress: showing the learning products in front of the class, selfevaluation, front evaluation, mutual reading, mutual pair reading.

For each learning activity, it is specified how the continuing evaluation is done. (Chisiu, 2011)

### **3. The teacher's role in the development cognitive constructivist learning**

Learning is thus an active process of building this reality. The reality is constructed by each individual, which gives a unique significance, based on his own experiences. The student simply does not transfer knowledge from the outside world in his memory, he builds his own interpretations of the world, from his interactions with it. Knowledge is open to negotiation and, in this respect, the social context plays a major role in learning. For the constructivist teacher, the teaching means testing the student's meanings. A constructivist vision supports the student in guided findings, encourages exploration of different views, collaborative learning, project-based approach, etc. The student has a proactive role, because he is the decision maker in his approach to building knowledge, accompanied and supported by teachers who have the task to provide a rich learning environment and incentive.

Constructivist tasks focus on mentally active engagement of students throughout the learning to manage in-depth information processing. The teacher will use teaching strategies to help the student to:

- select and encode the information they contain;
- organize and integrate information in their own systems;
- retrieve information in long-term memory. (Joita, 2002)

In this process the role of the educator's responsibility is to provide an environment prepared for exploratory work of the student.

Teaching methods favored by cognitive constructivist approach allow multiple learning paths, taking into account individual variables that influence the information processing.

The methods *I know /I need to know /I have learned*, *SINELG*, *Mutual Reading*, *Reflexive Journal* and *the Mosaic Method* are just some of those which make learning from what students know about the proposed topic, categorize information, share opinions and make reciprocal teaching. (Chisiu, 2011)

The teacher will prepare constructivist learning environments open, stimulating the students to be able to test their assumptions, to confront points of view, etc. Educational software technologies, hypermedia, multimedia, interactive platforms can be used to provide a flexible environment for student exploration and building their own knowledge.

For this, the teacher will assume the role of facilitator of learning that:

- Accepts and encourages student's autonomy;
- Uses a variety of materials and encourages students to use them;
- Asks students' opinion on new knowledge before sharing his own knowledge;
- Chooses methods that make possible the sharing of ideas. Encourages students to interact with him and with colleagues;
- Encourages students to explore knowledge and to ask questions;
- Trains students in experiences that produce contradictions and then encourage discussions, even if they are contradictory;
- Proposes learning activities that operate with new information until they are integrated into relevant knowledge. (Brooks, Brooks, 2001)

#### **4. Evaluation of cognitive constructivist perspective**

In terms of skills training and assessment test constructionist constructivist approach can be thought as a reference sample having analyzed below. The making of the sample starts with the covered competencies, which are connected to essential contents. It operates with the essential knowledge, the necessary context for life or for further learning, which give effect to motivate learning and effort required.

The tasks target both the operations and the lower levels of the higher than whatever, in a gradual way.

The link between skills and tasks proposed targeted ensures the validity of the assessment. Table 2

With the assessment test, the student is recommended to receive an array of specifications that include: skills expected to be manifested, work load, and maximum score for each item. This way the student can self-assess, becomes a partner in his own training.

#### **4.1. Sample Evaluation**

Chemistry cl VIII

Theme: salts: NaCl, CaCO<sub>3</sub>, CuSO<sub>4</sub>, NH<sub>4</sub>NO<sub>3</sub>, NH<sub>4</sub>Cl

Highlights on the task and assessment criteria:

1. Choose a salt of the list again.
2. 4p. Specify the chemical usual name

3. Explain 9p forming chemical name.
4. 10 p. Characterizing the salt viewpoint of the structure, physical properties, indicate at least 5 features.
5. 27 p Exemplify the chemical properties of the salt resorting to virtual testing using the software: Virtual Chemistry Lab  
[http://chemistry.dortikum.net/download/chemistry\\_setup\\_en.exe](http://chemistry.dortikum.net/download/chemistry_setup_en.exe)  
 Perform at least 3 experiments.  
 For each experiment on chemical properties, print screen will perform the experiment.
  - a. Describe each experiment showing:
    - Stages
    - Watch
    - Benefits
    - Risks
 8p is given for each experiment described.
  - b. Nominate at least three chemical properties; 3 P.
6. 5x10 p Indicate at least 5 using showing:
  - a. The field is used; 1p
  - b. Why is it used? 2p
  - c. Advantages; 2p
  - d. Personal opinion; What would happen if the salt does not exist? What risks exist in relation to its use? At least 5 ideas

Each item in the sample evaluation has benchmarks for achievement and assessment criteria at the same time. Students self-evaluate their work based on given criteria and will give a certain score. It is a learning experience that makes them share in the construction of their own learning. Table 2

Table. 2 Self Assessment / Evaluation

Items	2	3	4	5			6a	6b	6c	6d	Total	
<b>Maximum score</b>	4	9	10	3	8	8	8	5	10	10	25	100
<b>Self-assessment</b>												
<b>Assessment</b>												

Table 3. The connection between the items and skills assessment test subjects:



## 5. Assessment - source and learning opportunities

<i>The relevant competent/Skills of unit evaluated</i>	<i>The task as we receive students</i>	<i>Criteria and scoring rubric</i>
CS1.1. Explaining observations to identify some applications of chemical phenomena.	6a Areas where it is used	5
CS 1.2. Deduction uses of chemical substances based on physico -chemical properties.	6b Why is it used?	10
CS 2.4. Using equipment and laboratory equipment, information technologies for the study of different substances.	5b Steps experiment	3
CS 2.5. Conclusions and generalizations to highlight the physical and chemical properties of composite materials.	5f Nominate at least three chemical properties	3
	5c Advantages	6
CS 4.1. Communication in written / oral approach results of an investigation using scientific terminology.	3 Explain the formation of the chemical name.	9
	2 Discuss the chemical name, common name	4
CS 4.2. Presenting the results of an investigative approach using scientific terminology.	4 Characterize salt in terms of structure and physical properties	10 Show at least 5 features
CS 4.4. Communicate the results of an investigative approach to the Internet.	5a For each experiment on chemical properties, will conduct the experiment print screen	3
CS 5.1. Findings of the advantages and disadvantages of using chemicals.	5e Nominate at least three chemical properties	6 3 chemical properties
	6c Advantages	10
CS 5.2. Identifying pollutants of water, soil, air and ways to prevent / reduce pollution.	5d Risks	6
	6d Personal opinion; What would happen if the salt does not exist? What risks exist in relation to its use? At least 5 ideas	25

In assessing students' performance the educators measure and appreciate the achieved knowledge using marks or notes. Often in the process of

evaluating teaching is a neglected decision, operation of the evaluation, which prolongs the act of assessing as a characterization, judgment, recommendation and targeting measures to improve the work in the next stages, the operation in which the student could find a source of learning . What we propose the in following lines is paying attention to the decision, a source of evaluation, teaching and learning opportunities' approach

Rewiev-example:

After the administration of evaluation tests recommended an analysis and interpretation of results obtained using a matrix in like the one below.

On one dimension (vertical) appear graders, and the other (horizontal), specific skills evaluated. Next to each student, we will either using percentages (70%) or the numerical expression (5 answers 7), the success achieved by each student for each objective.

Analyzing the vertical results we can realize that the specific skills targeted at grade level, were not conducted in a measure to thank us and is recommended to be reintegrated into learning units next to be resumed for practice. (Chisiu, 2011)

Looking horizontally, we can appreciate the level of achievement of each goal by each student and will be able to make assessments and recommendations necessary for a development program or compensation. In the next hour, will hold a differentiated activities. Students will be grouped according to performance achieved and compensation or development needs. It will be incumbent group centers on Objective 1, incumbent on target groups 2 and so on. It can perform spins, until each student reach each group rehabilitation center, according to personal needs. Students who have achieved the sample, all goals can work at a development center as tutors in groups or compensation, depending on the needs and desires which it expresses. Such activity is an effective way to differentiate a cross learning on the student's interests, to put in the position of active partner in their own development. As part of decision we can achieve differentiation of learning:

- in terms of learning potential and performance achieved; create groups of students who achieved similar performance, enabling them to slowly upgrade the learning or recover their gaps and misunderstandings.

- the theory of multiple intelligences; those with intelligence, interpersonal, networking will be satisfied with the others and will be tutors, will illuminate the realization of tasks, those with poor results. Those with intrapersonal intelligence were able to make a personal development program;

- in terms of motivation; those who are motivated by challenges that it creates new problems, difficult, complex can choose development centers,

others are motivated by the recognition given by others and reward (praise), will accept the role of tutors. (Popa, 2009)

This teaching strategy will enable unambiguous feedback through performance reporting on specific skills that were followed, will make teaching evaluation to be completed which means necessary decision recommendations to each student in order to prevent the delays and at the same time make it possible as a source of consideration and evaluation, as learning opportunities, competent society association values.

### **Conclusion**

Integrated Competency involves complex knowledge, skills, abilities and attitudes that give him what possesses the right to say: I know how to do this! This does not mean giving in school learning to knowledge or a fundamental change in the contents but a different approach to their pragmatic more applied, by putting them to work in practice, either with an approach that means a building which the student himself participates, by involving the whole being: personal experience, knowledge, action, motivation, attitude. To achieve such learning in school learning, it is necessary to respect several principles:

- Learning to make sense, leaving it in a meaningful context for the students in relation to concrete situations, which the Track will meet later or sense to it;
- Distinguish the essential from what is less important, insisting during learning and evaluation is useful or necessary for further learning in life;
- Learning to use the knowledge in life situations and not limited to the student's head filling with diverse knowledge to target these links the knowledge and values of the society;
- To establish links between various concepts studied, integrated approach to learning, to be able to effectively resolve the situations that confronts, to enable it to cope with unexpected situations.
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Both ways that is approached teaching design through learning activities covering levels of Bloom's taxonomy by learning methods proposed, material of resources that simulates the concrete situations of life the way that makes learning and in the assessment, we see these principles.

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