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# Google Apps for Education – a powerful solution for global scientific classrooms with learner centred environment

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## Abstract

This article provides a description of possibilities provided by Google Apps for University and K-12 education. The theoretical section is written in accordance with mathematical models of learning aimed to develop metasystems thinking. The practical section provides the practical guidelines for application of Google Apps for Metasystems Learning Design through collaborative learning and self, peer and group assessment. The advantages of Google Apps for Education are discussed with regard to new learning strategy of the science, math and technology competence development. The opportunities for integrated competence based structure are provided and discussed.

***Keywords**:* philosophy of learning, learning design, constructivism, electronic textbook

## 1. Introduction

Globalization adds new values to educational system. The implications of globalisation for teaching, learning and assessment are: the focus on abstract concepts; the use of holistic understanding; the enhancement on student's ability to manipulate symbols; the enhancement of the ability of learners to access, assess, adopt, and apply knowledge, to think independently, to exercise appropriate judgment and to collaborate with others to make sense of new situations. In the Globalisated Age the research and development is a critical component that blurs the distinction between mental and physical labour. The educational system became more open and flexible. The globalisation encourages students to work in teams and to be engagement in global classrooms around the world. New skills and new types of behaviour are essential to enable people to be part of this trend. The academic institutions become less rigid and more flexible in their attempt to meet the varied needs of learners and the global economy. But, "students will have to learn to navigate through large amounts of information, to analyse and make decisions about it, and to master new knowledge domain in an increasingly technological society. They will need to be lifelong learners, collaborating with others in accomplishing complex tasks and using different systems effectively for representing and communicating knowledge to others" (Midoro, 2005, p. 32). Instead of this are used a wide range of synchronous and asynchronous activities, which break the boundaries of space and time (Kalantzis&Cope, 2006; Cogburn, 2011).

There are new learning design approached and methodologies for Globalisated Age (Cooper, 1993; Gustafson&Branch, 1997; Hakkinen, 2002; Donovan&Bransford, 2005; Edyburn et al, 2005; Eun et al, 2008; Glahn, 2009; Carr-Chellman, 2011). The issue of learning design rely to what a method is planning for students. Usually the learning content is designed for "digital natives", but by "digital immigrants"(Prensky, 2001). In case when the difference is not essential, the learning designer takes into consideration the input,

output, feedback and the state of cognitive system. Metasystems learning design is one of them (Railean, 2010). The metasystem learning design approach is based on meta-synthesis methodology (Hall, 1987).

One of the main problems of the learning design is learning management. Through fostering globalisation, the scientific management is replaced by knowledge management (Koulopoulos, 2000). The knowledge management processes represent the base of cybernetic modelling of didactic process. The role of technology is to provide a new differentiated teaching, learning and assessment tool, which offers the possibilities of personalised courses of study based on constructivism bases.

Another challenge is learners, which are the main protagonists in own teaching, learning and assessment. The learners' greatest need is to be able to learn at his/her own place, which can be both real and virtual. More that accumulation of ineffective knowledge, the learner today needs to become more and more adaptive and accommodative at constantly-changing world. New methods for learning need to be used in order to develop the dynamic and flexible structure of competence, which allows students to observe, to find relevant information, to communicate with peers, to think about quality of knowledge and to learn how to learn.

Metasystems learning design is focused on metasystems thinking development. The metasystems represent a "integration of systems is carried out by a parameter set regardless of whether these systems have one set of variables or not" (Kapra, 2004). The metasystems thinking can be proved by integrated structure of competence. Such a structure is dynamic and flexible and is formed when the synergic effect is occurring.

Google Apps represent a suite of free email and collaborative tools for K-12, University Education, or large school districts, university consortiums, and state governments to create high-level legal agreements. The most useful links are: http://www.youtube.com/GoogleDocsCommunity, http://www.google.com/newproducts/, http://sites.google.com/site/gtaresources/files/Crib_Docs.pdf?attredirects=0 and. The role of these tools for teachers is to provide a learning environment for team work as a need for each child in order to develop self – regulated skills. Imitation, cooperation, confrontation, discussions and sharing are all part of the development of the individual and his or her socialisation. These tools play an important role in their cognitive, affective and psychomotor activities.

## 2. Cybernetic Learning Models for Globalisated Education System

Google Apps are useful for learner-centred environments. The shift paradigm from teaching to learning and from teacher-centred instruction to learner - centred instruction was described by Sandholtz, Ringstaff and Dwyer in 1997. According to the new learning paradigm teachers act more systematically as advisors, guides and supervisors, as well as providers of the frameworks for the learning process of theirs students. The students have greater responsibility for their own learning in this learning environment, as they seek out, find, synthesize and share their knowledge with others. For these achievements are used peer, self and collaborative methods. These methods are useful both for teaching and assessment. The focus of collaborative assessment is problem –solving. Chalmer (2001) notes that collaborative conversations among the people involved with the problem, focused on how they are affected and how they have been effective against it. Standardized tests are used (if at all) to provide additional descriptive data about the problem. The product of collaborative assessment is solutions generated and implemented by the people affected by the problem; a written summary or other documentation, if needed, written in everyday language. In collaborative assessment, the facilitator works from the assumption that life as lived by real people is far richer in its details and potential meanings than any possible description or generalization of it and that therefore can capture all of the possibilities inherent in a situation that people experience as problematic.

The role of Google Apps for assessment can be proved by different models, for example: Social Learning Model (Bordogna&Albano, 2001), Statistical Learning Theory (Guergachi&Patry, 2002), Neo-Vygotskian sociocultural perspective (Zbiek& Conner, 2006), the algorithm to form the group in collaborative learning and others.

According to *Social Learning Model* the cognitive impact (CI) acting on an individual is the overall result of those interactions with his/her environment, capable of modifying his/her knowledge, and the self-elaboration of such influence. He/she can also become a source of CI to other individuals by persuading and supporting. The persuasiveness, $P_{ji} \geq 0$, describes the degree to which the *i*th individual can persuade the *j*th individual. Also, the support, $S_{ij}$, describe the degree to which the *i*th individual support the statement of the *j*th individual during, e.g., a discussion. The knowledge of the *j*th individual $\sigma_j(t)$, at time *t*, is defined as a

dynamic variable such as $-1 \le \sigma_j(t) \le 1$, where $\sigma_j(t) = 1$ corresponds to *optimum knowledge*. In the authors' point of view, the CI due to all multimedia information accessible to the *j*th individuals given by:

$$[1] \quad CI^{MM}(j,t) = A(j)Q(t)(1-\sigma_j(t))$$

where $0 \le A(j) \le 1$ is the ability of the individual to search and locate the information in the Internet, its capacity of understand such information, to perform critical analysis and to establish relationships among correlated topics. On the other hand, CI due to social interaction through discussions assumed to be:

$$[2] \quad CI^{SI}(j,t) = \sum_{i=1,\ i\neq j}^{N} [P_{ij}(t)(1-\sigma_i(t)\sigma_j(t)) - S_{ij}(t)(1+\sigma_i(t)\sigma_j(t))]$$

where the first(second) terms accounts for mutual persuasiveness (support), and *N* is the number of individuals. $S_{ij}$ and $P_{ij}$ depend on the strength of psychological coupling, affinity of social and educational status, rhetorical abilities, personal skills, etc. The knowledge is considered a dynamical variable which changes as follows:

$$[3] \quad \sigma_j(t+\Delta t) = \sigma_j(t) \pm \Delta\sigma$$

where $\Delta t$ represent an interval of time, $\sigma_j(t)$ - a discrete variable and $\Delta\sigma$ - a quantum of knowledge. For this consideration $\sigma_j(t)$ may improve (or become worse) with a certain probability. Both processes have their own noise.

Guergachi and Patry (2002) describes the concept of system model identification. In the author point of view a system *S* whose state space x is a finite dimensional one can be represented by a mathematical model of the general form:

$$[4] \quad \dot{x} = f(x,\ t,\ p)$$

where $f$ is a mathematical function which is generally nonlinear, $x$ is the system state vector, $p$ is the parameter vector and $t$ is the time. A fundamental problem in system modeling is the determination of the values of model parameters $p = \{p_1, p_2, ..., p_k\}$ such that the corresponding response of the model equation approximates as closely as possible the actual response of the physical system.

Kitagaki et.all.(2007) reports about new algorithm to form the group in collaborative learning. The number of members in each of groups is the same and each group response to the same number of questions. Question *j* and question set are expressed by $m_j$ and $M(m \in M)$, respectively. The student *i* is engaged in one group *g* and the student sets is expressed by $s_g(s_i \in g)$. Result *e* of evaluation the answer $m_i$ and student $s_k$ are expressed by $e(m_i,\ s_k)$. In case when the answer is correct $e(m_i,\ s_k) = 1$, vice versa $e(m_i,\ s_k) = 0$. The model of grouping is represented as following:

$$u_g = \frac{\sum_{s_k \in g} \sum_{m_i \in M} (1 - e(m_i, s_k)) \bigcup_{s_j \in g} e(m_i, s_j)}{|M \parallel S_g|}$$

where |M| denotes the number of elements of set M, and *ug* – the model of groping with one pattern. For general case, when the group is formed by students from one class, grouping *u* is expressed by

$$u = \frac{\sum_{g \in G} u_g}{|G|}$$

If students is grouping as 4 from the total number is 20, this can be expressed as s1, ....sN.

$$\begin{array}{l} s_1 \text{ and } s_2, s_1 \text{ and } s_3, \cdots, s_1 \text{ and } s_N \\ s_2 \text{ and } s_3, s_2 \text{ and } s_4, \cdots, s_2 \text{ and } s_N \\ \cdots\cdots \\ \cdots\cdots\cdots\cdots s_{N-1} \text{ and } s_N \end{array}$$

So, the group in which *u* is optimal is considered the maximum or optimal grouping.

One main idea that is widely adopted for Globalisated Educational System is the concept of *zones of proximal development* (Vygotsky, 1978). Lesh&Lehrer(2003) note that student's level of understanding can be influenced by a variety of factors such as: guidance provided by an adult or peer, conceptual tools that may be available either by luck or because of interventions from an adult or approaches limited by sociocultural norms and standards that have been developed by relevant communities—such as students and teachers in classrooms. In the author point of view, the notion of a zone of proximal development needs to be expanded from a *1*-dimensional interval to an *N*-dimensional region in which a variety of paths lead to any given construct.

On the other hand, the globalisated learning system is both real and virtual. This implies a need for *Neo-Vygotskian sociocultural perspective.* Zbiek and Conner (2006) comments, that learning is a discursive activity that involves social and material resources. Mathematical modeling of learning is a non-linear process that involves elements of both a treated-as-real world and a mathematics world. The modeling process involves movement among elements such as the real-world situation, solution, a mathematical entity, and a mathematical solution. This can be done by enhancing motivation through real simulations or activities that prove the real world insight.

## 3. Competence-based Knowledge Structure and Google Apps

Google Apps can be useful to develop metasystems thinking. As opposite to linear thinking, metasystems thinking views conversion –replacement of systems and it is above the procedure of transforming the data into knowledge, skills and attitudes which makes it more than a collection of special case study. Their elements (sub-systems, environments, processes) "correlate" in order to have a common base, named knowledge space, which can be easy updated in time. Neo-Vygotskian socio-cultural perspective proves the GAE paradigm, allowing designing more logical structures, which can be analyzed using mathematical learning theory of non-linear processes. This means that learning is a discursive activity that involves social and material learning objects; the mathematical model of learning describes non-linear processes; feedback is both immediate and delayed, and that learning environments are both real and virtual. New learning relies on new educational ideal, named professionalism, planetary thinking and global culture. This means that focus of learning design needs to be how to learn abstract concepts; how to use holistic understanding; how to enhance student's ability to manipulate interactive symbols; how to teach the ability of learners to access, assess, adopt, and apply knowledge, to think independently, to exercise appropriate judgment and to collaborate with others to make sense of new situations.

According to Heller et al, 2006 the competence-based knowledge structure can be represented by the knowledge of the learner in a certain domain, which is characterized by a set of assessment problems (denoted by *Q*). The knowledge state of an individual is identified with the set of problems the person is capable of solving. There are various possible learning paths for moving from the native knowledge state to the knowledge of full mastery (set *Q*). Each knowledge state (except *Q*) has at least one immediate successor that contains the same problems, except one (set *Q).*

A knowledge structure in which learning is taken step by step is called stochastic or *well graded*. But, what is step-by-step learning: auditive learning, visual learning, and haptic learning, learning through the intellectual intelligence or holistic learning? Can one student be deeply engaged in learning, if design of the competence-based knowledge structure is based on classroom activities in learner-centred environment?

In our point of view, the answer to these questions is competence-based knowledge structure. The competence-based knowledge structure can be developed according to EQF standards, if learning will be designed according to *Learning Metasystems Design* (LMD) approach. Metasystems approach represents an alternative paradigm to systems approach dominant in the educational technology and instructional design. The core principles derive from philosophy, pedagogy, cybernetics, psychology, and management (Railean, 2012).

The competence based knowledge structure, named *savoir–vivre,* integrates *savoir-dire or savoir* (which represents „theoretical and verbal knowledge" (Minder, 2003), *savoir-faire* (which represent „learner's own strategies, methods, procedures, and techniques" (*ibidem*)) and *savoir-être* (which represents „wishes, affectivity, emotions and motivations" (*ibidem*). Such a structure represents the main learning outcomes of globalisated learning system, which can be defined, using EQF terminology, as proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development.

The competence cannot be developed as rigid knowledge applicable for closed system. The main figure of this system is the teacher, which is an expert in domain and in management of the learner's cognitive activity.

As a result, the instructional processes are regulated both by *A* (leader) and *B* (leaded object). *Z* represents a channel for transmission of the information from *A* to *B*, and *X* – for transmission of the information from *B* to *A*. The efficiency of such a process is the coefficient of assimilation. For the computer-aided instruction software this is the case of interactive and adaptive tutors. So, the process of learning consists of successful passing of the knowledge (system B) from stage $a_0$ to state $a_k$. The system *B* had traversed a lot of the intermediary cognitive states after positive answers of proposed items in the operational cadre. Each of the intermediary states is characterized by one of the knowledge' levels: $R_0$, $R_1$, ...$R_k$ and can be represented using *n* – size vectors. Transformation of the system *B* from $a_1$ to $_{ai+1}$ is the result of the student cognitive activity. The system A stimulates the cognitive processes happening in the system B and the stimulation is mainly positive. In the case of positive stimulation the system passes from stage $a_1$ to aimed stage $a_{i+1}$, but maintains the equilibrium. In the open system there is a negative stimulation. In this case the cognitive system loses the equilibrium and passes from a1 to one of possible stages. The bidirectional transmission of dates depends on the nature of perturbation factors (globalization, digital natives, and the specific output: digital competences).

Google Apps change our visions about the output of learning processes. Many applications are expected to be used by very different groups of users with different backgrounds, *a priory* knowledge and learning.

The competence-based knowledge structure is dynamic and flexible. The dynamicity and flexibility signifies that the structure is strictly individual and can be formed only after each individual has been deeply included in learning process. The strategy of LMD is based on the following principles: the principle of self–regulation, the principle of personalization, the principle of clarity, the principle of dynamicity and flexibility, the principle of feedback diversity and the principle of ergonomics.

Google Apps http://www.google.com/apps/intl/en/edu/ are a powerful tool to develop knowledge proved by social skills. It is designed for Higher Education, K-12 and large school districts. Google Apps include free email and collaborative tools, which permit to connect campus through emails, messaging, phone and video calls from a single interface. The students and the staff can share ideas, collaborate and work together. They use email, chat, voice and video calls. The activities can be planned and managed efficiently, using Google Docs and Google Calendar. The schools can publish school event calendars, plan meetings and share course schedules. Google Apps permit to connect tablets, e-Readers and other mobile device.

## 4. Google Apps for studying Science, Technology, and Math

Basic Competence in Science, Technology and Math is one of EQF eight key competences. It requires the ability to develop and apply mathematical thinking in order to solve a range of problems in everyday situations, the ability to use mathematical modes of thought (logical and spatial thinking) and presentation (formulas, models, constructs, graphs, charts). The competence in science requires the ability and willingness to use the body of knowledge and methodology employed to explain the natural world, in order to identify questions and to draw evidence-based conclusions. Competence in technology is viewed as the application of that knowledge and methodology in response to perceived human wants or needs. Competence in science and technology involves an understanding of the changes caused by human activity.

Basic competence in Science, Technology and Math is expected to be developed before the phase of the K-12 will end. So, Google Apps, designed for K-12, provide emails and tools for collaboration and working anytime and anywhere. Fast, easy collaboration is what makes Google Apps unique. This means that K-12 students can edit one document together in real-time, without attachments. Moreover, the students can work together in assessment projects. Self, peer and group assessments are the most useful strategies for this approach of learning. As was noted by Roberts (2006) with reference to Schunk (2000) "developing self-assessment strategies helps students gain control over their learning …[and] allows them to focus more effort in studying those areas where they need more time". Peer assessment refers to the process of having the learners critically reflect upon, and perhaps suggest grades for, the learning of their peers. It is important for the instructors to provide clear and concise guidelines, and for the instructor to maintain the ultimate responsibility for the final grades. Group assessment covers the meaning from assessment of groups as a whole, to the assessment of individuals within a group and the group members assisting other group members' contributions to the group.

One idea is to engage students in Global Scientific Collaborative Classrooms. The idea is to redesign the introductory University's mathematics, chemistry, physics and biology courses using collaborative learning environment. The proposed idea aims at the production of a new generation of personalised e-textbooks with stimulators, intelligent analyses of students' answers and virtual laboratories with semantic-based items. A real way to make this idea a reality is to join the technology of virtual learning environment and the methodology of electronic textbooks. There are a few uncertainties that need to be addressed. The uses of formal teaching

methods, tutorials, true/false and multiple-choice tests are unwelcome. So, the assessment through multiple-choice questions could be set so that the student had to select a correct answer to each question or introduce a short answer and obtain a prompt individualized feedback before moving to the next frame.

The role of global collaborative learning scientific classrooms in studying Science, Technology and Math is based on the application of a method of instruction in which students with various performance levels and culture of learning work together in small groups, towards a common goal. Proponents of collaborative learning claim that an active exchange of ideas within small groups not only increases interest among the participants but also promotes critical thinking. To achieve the collaborative learning environment will be used dynamic and flexible instructional strategy. Shared gives students an opportunity to engage in discussion, take responsibility for their own learning, and thus become critical thinkers. As a result, the students become deeply involved in personal acquisition of knowledge and the learning is more efficient.

The K-12 students involved in the scientific collaborative networks will be intrinsically motivated to learn science, math and technology. Moreover, the scientific collaborative classrooms increase understanding through metacognition. The thinking processes become more critical and creative. The creative thinking proves the role of cognitive processes, if the learning design will take into consideration "to put elements together to form a coherent or functional whole, reorganize elements into a new pattern or structure " (Anderson, 2001).

## 5. Toward Metasystems Learning Design with Google Apps

Google Apps can be viewed as a promoter of Learning Management Systems like Moodle is. In the case of University Learning we used Moodle for teaching the course "Methodology of Educational Software Development". During the course was observed that students need new collaborative tool for self, peer and group assessment. Moodle, with its traditional computer-based assessment items, designed to apply it in solving scientific problems no longer meets the requirements. The students need more personalised learning environments and new methods of assessment (figure 1).

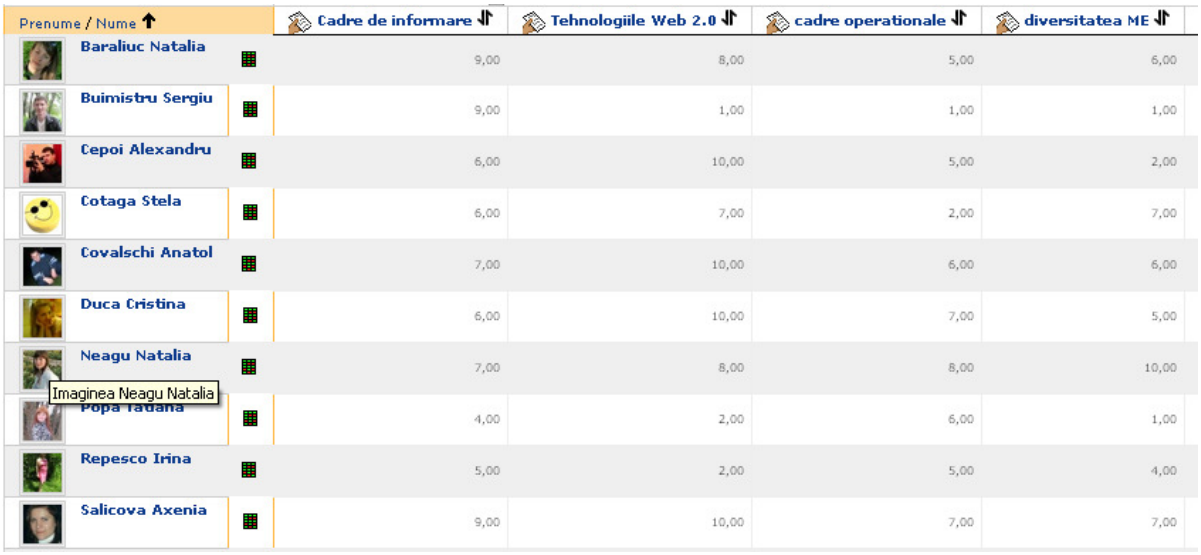


**Figure 1.** The personalised learning environment

Students need to develop integrated competence-based knowledge structure in a collaborative environment and, also, to design and conduct own or group research as well as to analyse and interpret data gained from real learning objects. That is why the global scientific classrooms with learner centred environment are a need for metasystems learning design. The metasystems learning design priorities are: optimized knowledge graph, individual differences via performance, cognitive style experience (*a priori* knowledge), culture of learning and complexity, difficulty, abstraction variables. Well-designed, learner-centered, affordable, easily accessible, efficient, and effective flexible learning systems meet learners' needs, if they include on-demand, anytime /anywhere high-quality learning environments with good support services. In other words, this means flexibility in learning, in which students learn, choosing technology; time and location from their own pace.

Google Apps is one of the useful tools that can supports flexible and collaborative learning environments. The theory of flexible and collaborative learning environments include problem solving skills evidence as „

distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance, or in collaboration with more capable peers" (Vygotsky, 1978). Problem solving proves the evidence of assessment (peer, group, cooperative). „ Peer assessment refers to the process of having the learner critically reflects upon, and perhaps suggests grades for, the learning of their peers. Peer assessment is distinguished from group assessment in that students assess each other's learning, even though the learning may have occurred individually, or at least outside of any formal collaborative group"(Roberts, 2006, p. 6).

Constructivism views knowledge as to be co-produced by learner rather that processed from information received from an external source. Applications of the constructivism philosophy to learning with electronic textbooks fall into two areas: cognitive constructivism and social constructivism. The cognitive constructivism views learning through processes of assimilation and accommodation. These processes are accompanied by equilibrium and non-equilibrium. The equilibration occurs when children shift from one stage to another and is manifested with a cognitive conflict, a state of mental unbalance or disequilibrium in trying to make sense of the data or information they are receiving. Non-equilibrium is a state of being uncomfortable when one has to adjust his or her thinking (schema) to resolve conflict and become more comfortable.

Social constructivism views knowledge development as social constructivist environment, which includes activities where students experience their level of understanding and seek assistance to get to the next level. The teacher assistance is developing social competences through leading discussions and conversations, persuading, co-operating, working in group etc.

Constructivism methods are widely applied in modern learning environments: multimedia, hypermedia authoring tools and VRL technologies. The aim of the designer is to select and optimise the content in order to provide understanding in problem solving, critical thinking, formulating questions, searching for relevant information, making informed judgements, efficient use of information, self-reflection, inventing and creating new things etc. The role of learner is to research, to organize data, to communicate, to present the project etc. The assessment and the instruction need to be in harmony. Assessment needs to be more goal-free and based on learning outcomes that reflect the process of knowledge construction. Higher order thinking skills need to be the object of assessment, too. Assessment should go beyond measuring the reproduction of information or factual knowledge and summative activity. This is a shift from content of the learning material to the competences and the change in performance expected at the end of the learning subject. Written examinations are replaced by coursework.

In order to design effective learning environment need to be developed the mathematic and cybernetic models.

The key concepts of Metasystems Learning Design are an optimized knowledge graph structure. Such a conceptualization allowed developing a new didactic model, based on processes and feedback. The processes are classified as: communication/information processes, cognitive activity processes and computerized assessment processes. The communication/information processes are defined as the transfer of knowledge over time through a transmitter (for example, the e-Learning platform, instructional system, networked computer, from the source (tutor/mentor, learner/group of learners, environment) to the recipient (the learner' cognitive system). The cognitive activity processes represent the development of knowledge through actions and constitute an ensemble of interdependent actions with a final educational outcome.

Computerized assessment processes are characterized by the diversity of feedback and feed-forward. There are two rules that must be followed: the task must be written as a set of rational steps and the tasks must be defined as clear as possible. The assessment is both formative and summative. The user interface design of formative assessment allows verbal and non-verbal communication, both oral and writing. Summative assessment is individual, peer, and group or collaborative (or cooperative).

The common rule to apply the Meta Systems principles is the coefficient of assimilation $K\alpha$ (where $0.3 \leq K\alpha \leq 0.7$). If $K\alpha \geq 0.7$, it the system can be observed *the synergistic effect*. The synergistic effect is an indicator that evidences the finish of the (instruction) teaching phase and starting the self-regulated learning, as was noted by Bespalico, 2007. Some comments need to be provided: if $K\alpha \leq 0.7$, the learning process can be corrected using software tutoring and for $K\alpha \leq 0.3$ the learning processes need to be corrected radically.

## 4. Conclusion

The concepts tested using Google Apps tools are often done in an incomplete fashion and are very sensitive to the wording used by the developers. In addition, although the use of web-based instruction appears to be quite promising, there are some dangers in using Google Apps as a testing tool. Steps should be taken to ensure the flexibility and dynamicity in learning, the student's anonymity and the reliability of information transfer.

Google Apps need to be developed as a powerful tool for analysing students' answers like essay, mathematic formula or stereoscopy of the chemical formula.

The other trends seem to be testing the performance taking into account the individual differences via performance, such as cognitive style, experience and culture of learning. These can be done by the way of optimization of verbal and nonverbal learner– computer communications through knowledge graph. The other way is to analyse as much as possible the learning variables such as complexity, difficulty, abstraction etc. Leaning Metasystems Design links the competence forming with philosophy, psychology, pedagogy, and cybernetics and knowledge management. The competence forming is based on dynamic and flexible strategy, which allows developing savoir–vivre structure of competence that is more „adaptive and flexible at the permanent changing of the globalisated learning environment"(Railean, 2010). These principles integrate savoir-dire, savoir-faire and savoir-être in savoir–vivre functional and dynamic structure. If the principles are included in new didactical model with communication/information, cognitive activity and assessment processes, in the learning environment will be observed the synergic effect and self-regulated learning.

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