

## GRAPHIC ORGANIZERS IN THE CONTEXT OF CLASSROOM COMMUNICATION

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### **Abstract**

*Meaningful learning and learning efficiency are two reasons of this paper. They are intrinsic (they are intertwined as meanings in terms of importance) and generate consequences worthy of human axiology.*

*The topic of classroom communication and learning facilitated by graphic organizers is one of interest in the context of the evolution of pedagogic research in the curriculum domain, in which conceptual aspects (theorizing) prove their strength in the context of meeting utility and proficiency criteria.*

*Therefore, the theoretical underpinnings of classroom interaction having the graphic organizers as teaching tools, combined with the methodological-applied approach, supported by the results of such analysis, favourable to the approach and offering innovative elements from the perspective of curriculum habilitation.*

*Why learning mediated by graphic organizers?*

*Learning is the process through which knowledge is acquired in the teaching context. Learning can also be understood as the result of classroom communication, that's why, due to certain factors, and methodological-teaching tools (such as graphic organizers), it may have a greater impact in terms of knowledge generation.*

*Assessment, as a natural stage of educational process, has the same rules: the implementation methodological device is very important in efficient (accurate) and formative assessment.*

*An instrument often incorporated in teaching strategies is represented by graphic organizers, a meaning through which learning objectives are successfully achieved, the understanding of the concepts is reinforced, the relation among these are highlighted and learning is facilitated.*

**Key words:** *Classroom communication; Graphic organizers; Feedback.*

### **1. The role of classroom communication in learning**

The significance of learning is congruent with the human being ("our specialization as species is learning specialization", J. Bruner, 1967, p. 35). Therefore, searches related to understanding how the human being learns have fascinated and continues to fascinate pedagogy, in general.

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Learning efficiency lies, among others, in the proficient communication between the one who learns and the one, who, transmitting knowledge, supports learning. How the decoding of the information transmitted by the teacher is realized, assures the right understanding and efficient learning.

The channel used in teaching interaction should observe the specificity of the students' learning styles (visual, auditory, kinesthetic) and be a predictor of the teaching style.

The feedback used by teacher strengthens the evaluative approach, supports students' learning and ensures teaching retroactivity.

Approaches to graphic organizers integration (presenting pedagogical principles, the cognitive realities in which they are achieved, correlations with other mental operations, relations with other stages of teaching process) in curriculum strategies and the communication contexts, have existed in pedagogical literature so far: E. Bernat, *Effective learning technique* (2003), S. Collins, *How digital tools prepare students for the 21<sup>st</sup> century* (2004), Ch. Temple, J. Steele, K. Meredith, (2013), *Techniques applications to develop critical thinking*, R. M. Gavrilă, M. Nicolae, *ABC graphic organizers* (2015), as, indeed, many contributions in terms of graphic organizers in other didactical contexts: C. L. Oprea, (2006), *Interactive teaching strategies*.

### **1.1. The conceptualization of graphic organizers, meaning and significances**

The dynamics of information producing, of technology advancement, requests timely response in educational, professional and even daily contexts. The school as organization that teaches and produces teaching, changes both at the macro-structural and procedural level. The teaching – learning – assessment process recalibrates itself, being innovative, applied in nature, with elements specific to the context we live in. Basically, the school should shape the contemporary individual, capable of developing actionable skills, having the capacity to make quick connections, to build cognitive fields, all these being the results of a teaching process centered on student.

The teaching process has endured in time, influenced by behaviorism, cognitivism and constructivism, the main directions being imposed by evolution at the macro-social and scientific level. The transition from the traditional school paradigm, the behaviorist one, to the paradigm of the school centered on student, i.e., on skills training is essential.

The school focused on objectives, promoted by the behaviorist paradigm, is interested in individuals' observable behaviors, but not concerned with mental processes involved in learning. For the behaviorism followers, learning takes place when the student gives a right answer to a given stimulus. To achieve these results, the teacher relies especially on pedagogical methods which ensure increased retention. To achieve reinforcement, the teacher rewards correct answers and, sometimes, penalizes wrong answers. Teaching preparation is achieved through precise elaboration of learning objectives (in terms of observable behavior) and through content dispersion in logical learning units.

The targeted learning of behaviorist type is often of memorization type, defining and illustrating concepts or procedure application. Learning assessment is generally achieved through objective exams: the student has to demonstrate that he/she knows the right answer. The teacher is responsible for achieving learning objectives, creating an environment and a reinforcement system to bring the student in a position to adopt new behaviors. Classically, the teacher has the role of transmitting information, while the student becomes the receiver.

Cognitivism, as opposite to behaviorism, seeks to highlight the internal processes of learning. For cognitivists, the student is an active system of information processing, having the following components:

- the system of sensory perception, through which the student receives various environmental stimuli and implements complex processes of recognizing information;
- short-term memory, with limited capacity, in which the perceived information is transferred;
- long-term memory, with unlimited capacity, in which the information considered to be a "database" for the processes of recovering data is deposited afterwards.

For cognitivists and behaviorists, there is an external objective reality, but, in this case, the student has to integrate reality in his/her own mental schemata, rather than acquiring new noticeable behaviors. Therefore, learning is characterized by a change in the student's mental structures. The educational vision resulting from the cognitivist approach emphasizes the students' active mental commitment throughout the whole learning, to succeed in processing information in depth.

Therefore, the teacher will use teaching strategies which aim to:

- help the student in selecting and decoding information coming from the environment;
- organize and integrate information;
- recover information in long-term memory.

The teaching methods favored by the cognitivist approach allow multiple learning paths, considering the individual variables which influence how information is processed. The cognitivist teacher will mainly use new information and communication technologies that allow greater interactivity with students (smart tutorials or computer simulations).

From the constructivist perspective, a paradigm to which we subordinate the present role of graphic organizers, as pedagogical resources in the teaching process, teaching does not involve transmitting the student the meanings of another individual "who knows", but testing the student's meanings. A constructivist vision of education values active and non-directive pedagogy, favoring the real learning context, student support, rather than intervention, guided discovery, encouraging exploration of different views, collaborative learning, project-based approach, etc. The student has a proactive role, because he/she is the decision maker in his/her approach to knowledge building, accompanied and supported by the teacher, who has the task to provide a rich and stimulating learning environment. Knowledge is

open to negotiation and, this way, the social context plays a major part in learning. Constructivist learning is a construct of reality, a social construct.

A new paradigm of knowledge is equally sustained by the teachers' methodological motivation, who in their teaching design, advocate for the selection of actual, complex methods, which actively involve the student in the learning process. The active involvement of the student in the learning process is made possible by a complex strategy, based on active-participative methods. In the learning process, the student and teacher roles are also resized. The teacher, from a central character, becomes a facilitator, guides the student in learning, even as a partner. And the student learns due to his/her own motivation, learns responsibly, cooperating, through active involvement.

Constructivist learning is based on principles such as:

- learning is seeking the meaning, so that learning must begin from the things around which students try to build meanings;
- in the learning process the focus is on primary data, not separated (the whole is understood but also the components);
- the mental models used by students, determine the teaching strategy.

Therefore, the student is trained to think, to identify/to build new meanings and personal significances, memorization of correct examples being avoided.

Thus, in this current teaching context, the teacher is responsible for designing a framework for the signaled needs, but also consistent with the principles of the constructivist dominant, to identify sources and resources, so that the educational results will be achieved and approved.

The idea of designing an teaching framework based on GRAPHIC ORGANIZERS is a current, justified idea, which also involves a response for some questions, for every teacher:

- What are graphic organizers?
- To what extent can they be resources in the teaching process, so that they determine its streamlining?
- What is the value/educational virtue of graphic organizers in relation to curriculum and its structural elements?

Using graphic organizers is an effective way to get students to think, visualize and arrange knowledge. In a traditional classroom, most teachers rely on verbal exposure, reading and writing in order to represent and communicate concepts. Studies show that "when students create non-linguistic representations of their knowledge, there is an increase of brain activity" (Gerlic & Jausovec, 1999, p. 28). Whether the students create a concept map, a process diagram or a simple sketch, they have to appeal to analyzing capacities to clarify relations, organize their thoughts and formulate plans or the process steps.

The process of creating the representations helps students to retain information and develops their ability to transmit and share ideas in collaborative activity in progress.

Graphic organizers are representations, models or illustrations used in visualizing the information. It is recommended that they should be integrated in

learning activities by the individuals with a visual learning style. Graphic organizers are extremely useful to all categories of people who train themselves, as they illustrate the relations among concepts, ideas, factors (the relations may be of equivalence, subordination, causal, etc.). They facilitate knowledge understanding when a great amount of information is involved in a (short) given-time or with pupils.

Graphic organizers are visual representations that mediate between text and illustration, having the following characteristics:

- they are functional – analogue images, designed as conscious or intuitive code, with the intention of communicating pre-defined information;
- they emphasize the inter-relations among the elements of the represented reality;
- they address the visual analyzer through digital and analogic information embodied in signs (at least a digital element and at least an analogic one).

## **2. Effective classroom communication, facilitating and mediating student learning**

### **2.1. Graphic organizers integration in classroom communication**

Graphic organizers facilitate and mediate students' learning, and teaching and learning represent stages of the teaching communication process: "a good communication relationship is mediated" (Potolea, Neacșu, Iucu, Pânișoară, 2008, p. 289, our translation). These two premises highlight the formative valences of graphic organizers from the perspective of effective communication in classroom interaction. Moreover, H. L. Goodall (1990, p. 54) claim: "communication is learning" emphasizing the presence of communication exercises in all teaching strategies and, especially, in interactional ones.

This approach is analyzed by I-O. Pânișoară (2004), both from a procedural and functional perspective. The author presents, from a procedural perspective, the message as "a mosaic of objective information, valuable judgments concerning the information (subjectively) and valuable judgments and personal feelings outside these information" (Pânișoară, 2004, p. 48, our translation). Therefore, the cognitive organization of students' mental activity by the teacher, mentioned by Ausubel (1981), is completed, within the message approach, by subjective perceptions of the students.

Presenting the teacher's role as transmitter in classroom communication, I-O. Pânișoară endorses that "at the level of the message, there are two important effects: the effect of precedence in retaining some content elements with informative influence (data provided by the sender initially have more influence) and the effect of receptiveness (sometimes, the information disclosed ultimately has higher importance)" (Pânișoară, 2004, p. 49, our translation). From this perspective, the teaching value of graphic organizers is a functional one, especially when facilitating understanding, connection with prior knowledge and successful learning.

From the functional perspective, classroom interaction involving cognitive organizers and graphic organizers provides "a continuum that comprises the interaction methods (group communication through interaction methods):

- methods focused on producing ideas and problem solving (creative problem solving),
- methods based on group debate,
- methods centered on observing the interaction within groups,
- methods to optimize the relationships among groups", (Pânișoară, 2004, p. 277, our translation).

Here we may underline the functional role of cognitive organizers as facilitators of generating and displaying ideas and combining functions of graphic organizers, that of "merging two different notions – the forced connections technique or of attributes listing" (Pânișoară, 2004, p. 282, our translation).

The author (Pânișoară, 2004, p. 289, our translation), tackling the group communication issue through interaction methods – in the teaching context – draws attention to "challenges about how we think and use an optimal imaginative level", in relation to the students. The problem is addressed by J. P. Guilford and E. P. Torrance, later by Alex. F. Osborn and Ebert & Mitchell (*apud* Steers, 1998, in Pânișoară, 2004, our translation) regarding the level of cognitive complexity, mental reality that facilitates divergent or convergent thinking, as well as imagination and creativity.

The context is proper to analyze the benefits of cognitive and visual organizers, especially since the connection of new information is preceded by structuring the prior one, in Ausubel's vision (1981), and graphic facilitation is functional after high or low cognitive complexity.

Low cognitive complexity means:

- "tendency of categorizing and stereotyping, cognitive structures depending on simple fixed rules;
- only few related alternatives are generated;
- the personal contribution is minimal;
- there is little distinction between separated situations;

High levels of cognitive complexity (...) display the following guidelines:

- many related alternatives are generated and considered;
- individuals use many internal processes" (Pânișoară, 2004, p. 291, our translation).

Facilitation provided by graphic organizers to structure the information sent to students, in connecting new information with the previous one, in understanding the cognitive complexity of the relations between concepts, in combining them with elements of creativity, helps them during the learning process.

Thinking divergently or convergently is mediated by cognitive organizers, and, in their combination with the processes of imagination or creativity, graphic organizers become teaching instruments whose function of integrating content is an important one.

## **2.2. Graphic organizers contribution to the construction of visual learning**

Graphic organizers contribute to the construction of visual representations. *Representation is a secondary process occurring after a previous sensory experience. It is based on the mechanisms of memory and perception. Representation is today well defined in psychology and has a privileged position due to cognitive psychology. Considering representations as an element of thinking, they aren't subordinated to memory requirements, but also to norms of logical and semantic construction.*

Representations show a broad general criteria classification such as: the informative content criterion, the criterion of generalization level and the criterion of intellectual efficiency.

According to the informational content criterion, representations are very much alike perceptions due to the type of information processed through analyzers. According to this criterion, the analyzers, the senses offer sensory information which is then integrated through perception in a unitary complex image. Thus, we can identify visual, auditory, olfactory and kinesthetic representations.

Visual representations meet the best characteristics, features and qualities of a mental image. Visual representations are detached from the context, paler, less properly hued than the corresponding perceptions. At the same time, they distinguish themselves by form, efficiency and panoramic character.

Visual representations are strongly involved in activities such as painting, architecture, scenography, drawing, modeling. Typically, visual representations have a two-dimensional character. Three-dimensional mental images are less accessible, involve training, practising and even special endowment. As Piaget (1965) shows, three-dimensional special representations are available within the development of operative structures of intelligence.

*General and specific representations include in their structure, especially the characteristics common to an entire class of objects and based on these any new item can be recognized as belonging to the same group, namely for one object specifically. The degree of generality may differ. Some representations, such as the geometric ones, achieve the highest degree of generality and they are very close to the concept. They have greater importance in concepts forming.*

Mental images efficiency suggests the implication of descendent processing of cognitive degree. This way, representations show dynamism and associative availability. Through cognitive mechanisms, mental images are integrated in associative chains that offer them a high degree of efficiency and mental constructivism. Jean Piaget (1965) proposed that the level of intellectual efficiency to be established as criterion for the classification of static, dynamic and transforming representations.

In time, the efficiency of mental images is gradually developed. The efficiency level is closely related to the speed of rotation, there being an optimal ratio between the actual speed of rotation at the perception level and the speed of rotation at the mental level, but strongly connected to intelligence efficiency.

A good example is the mental images rotation. In various examples, the subjects have been requested to represent intermediate positions of three-dimensional objects or letters. It has been noted that graphic organizers, as teaching tools, determine the formation of visual representations, and their qualities. Information can be sometimes represented by body movements, for example when a student can move his/her hand in an arc, a circle or an ellipse to show the significance of these terms, or in the form of a letter. They can also make static forms to demonstrate understanding, therefore, kinesthetic representations support conceptual learning.

Also, the concepts may be represented graphically in the learning process. A variety of graphic organizers supports this approach. Graphic organizers help students acquire the necessary skills, to participate actively in the learning process and take part in the discussions, all these leading to achieving a higher conceptual level.

As teaching cognitive instruments, graphic organizers contribute to the formation of graphic representations, and to the streamlining of abstract learning at the conceptual level. Through conceptual maps, diagrams, images, chromaticity, information is made essential and stored for long time. In the teaching process it is important that the teacher should know both the psychological profile of the students, their learning style, but also the dominant of the styles mentioned above, so that he/she may design an authentic approach, tailored to the learning needs and styles.

### **3. Dynamics of graphic organizers relationship – initial, formative and summative assessment**

Designing the assessment strategy according to the teaching process, to the resources involved, determines a dynamic assessment and the dynamics of the component elements, as well. Since the most common forms of assessment are initial, continuous and summative ones, we'll analyze the three forms compared with graphic organizers, with the purpose of designing and achieving a strategy of effective assessment.

The integration of graphic organizers, as evaluation tools, is recommended for many reasons – to discard the stereotyped and low quality practices of teachers or the relative usage of applying only standard tools, such as assessment tests, but especially to achieve evaluation and learning efficiency and meet students' needs.

To ensure the success of the teaching process, the teacher starts with the initial assessment of students' performance. The purpose of applying this evaluation component is to identify the conditions under which students can further integrate their learning activities, in relation to their level of development.

Initial assessment serves as a diagnostic test, also having a predictive function, as it determines the design of study programme to be attended by students. At this stage, assessment through graphic organizers can verify and evaluate the level of knowledge, understanding and application of students' information in various complex evaluative contexts in cognitive terms, so that the students will be able to define concepts, totally or partially, to understand causal relations, to associate corresponding elements and features, to solve problems/ family of problem – situations.

Cognitive diagnosis is beneficial for students as it establishes an inventory of development level, the initial moment, baseline gaps between students, and allows the teachers to identify the causes of the recorded discrepancies and determine methods for students' development.

The predictive function of initial assessment refers to the activity of both students and the teacher. For students, it establishes the conditions of the programme they'll enroll to, and for teachers, how a learning programme is designed, as well as the choice of development and remedial strategies.

Formative or continuous assessment supports the opportunity of overall system adjustment, with successive steps. Being centered on the process, formative assessment focuses on some dominants that become landmarks in designing the assessment strategy:

- occurs during every learning task;
- is the ruling element of the student's training process (skills training, abilities and capacities training);
- has the potential to identify both strengths and weaknesses of the process;
- has criterial value;
- is internal to the learning process, continuous, analytical, focused on student learning;
- it can improve the valences of graphic organizers in teaching – learning-assessment process.

From the teacher's perspective, formative assessment aims to identify the difficulties, confusions or mistakes of the students, so that the teaching process may be corrected. It is the reversed connection of the assessment that allows self-regulation of the teaching process.

Since we want evaluation to be adapted, modernized, we recommend that *during continuous assessment graphic organizers should be used, which involve the assessment of skills, work capacities and attitudes*. Graphic organizers – *Venn Diagram* embodied in various forms (butterfly, H garden), *Cornell method*, *fish skeleton*, *grapes bunch*, *brainstorm (fireworks)* – ask students to identify *the main idea versus secondary idea* or to establish *similarities and differences* between two elements, based on their own observation, to interpret data based on identified similarities/ differences, to integrate the newly-acquired information, to establish cause-effect relationships, to make decisions based on reason, to generate various solutions for problem-solving situations, to establish the truth value of some assertions for different fields of knowledge, etc.

During continuous assessment based on graphic organizers, there can be verified factual, basic, conceptual, procedural, and metacognitive knowledge, students being capable of progressively proving all levels of cognitive development.

In formative assessment through graphic organizers the assessment results of students' activity are important, as they offer immediate feedback on their learning, help them identify potential difficulties and overcome them, ensures remedial work, encourage them to self-reflection, self-assessment and self-determination.

The contribution of formative assessment based on graphic organizers involves *advantages also for teacher's activity*, offering mechanisms to identify mistakes, to correct and adjust the teaching process, but also to adapt and diversify it according to student's needs.

Summative or cumulative assessment is in close relation of interdependence and complementarity with initial and formative assessment. Teachers support a summative evaluative process at the end of a learning unit, chapter, semester, with summative role and the purpose to correct occurred dysfunctions. At the end of a school year or education cycle, school assessment serves as a balance to which all students and teachers participate, to adjust the dysfunctions of study programme. Often, final assessment produces negative emotional states for students, such as fear, discomfort, even panic. It acts as general certification, as students can be certified after their level of proficiency is verified, being rewarded with diplomas and certificates.

The integration of graphic organizers in a strategy of summative assessment may have as objective the verification and appreciation of a complex volume of knowledge, according to the curriculum and the successfully completed study programme.

#### **4. The role of feedback, component of communication process, in school assessment**

Feedback is a tool permanently used, no matter the domain, both in personal and professional life. In terms of education, seen as communication process, the purpose of teacher – student communication is multiple:

- to transmit information;
- to develop students' thinking and personality;
- to develop the ability to solve problems;
- to develop capacities, feelings and attitudes;
- to make decisions on teaching strategies;
- to assess results.

Even if it is a reaction in order to maintain a certain balance within the teaching process, or an answer that aims at the personal growth of students in terms of emotional intelligence or at stimulating their positive attitude towards school, education, feedback has a decisive part and a prompt contribution.

Within the assessment process, feedback determines the identification of weaknesses, both for the process and the students, and then, the decisions making for optimizing the teaching process.

Depending on the time of the assessment, feedback is formative and summative.

##### *Formative feedback*

Obtained in continuous assessment, in order to identify students' weaknesses and strengths, but also to highlight their progress, formative feedback fosters teacher – student communication, openness to collaboration between teacher and students. Formative feedback contributes to maintaining a high motivational level for students and to reinforce metacognitive behaviors.

### *Summative feedback*

Conducted in final assessments, summative feedback represents a useful tool for teachers, as it provides the necessary information so that their teaching may be corrected according to students' answers. Summative feedback serves as assessing students' work, and as symbolic reward.

For the feedback to be efficient, it is necessary that during the assessment process, the evaluator teacher activate six categories of elements: "broad, expanded knowledge (what must be learned) (...), a set of skills, attitudes and dispositions toward the learning process (...), including the attitude to empathize with the learner, the ability to build/ create/ edit assessment tests (...), extensive and in depth knowledge of the assessment criteria and standards suitable to the chosen assessment tasks, expertise in formulating valuable judgements, based on the prior experiences of assessing students' performance related to some tasks, expertise in feedback communication towards students, parents and, eventually, educational authorities" (Royce Sadler *apud* Stoica, coord., 2001, p. 36, our translation).

For formative and summative feedback to be effective, it is necessary that the teacher display a high level of competence and the main characteristics of feedback – accuracy, comprehensiveness and adequacy. Receiving feedback from the teacher helps the students improve their achievements by highlighting the progress and accurate communication of results. With some feedback on their progress, students can check with the teacher and can ask questions. Shaping active, reflexive students, determining them to follow with interest and show an active attitude during evaluation, is an indicator of the teacher's teaching and evaluation skills.

### *Feedback effects through graphic organizers*

Classrooms are dynamic environments where teachers and students engage in continuous and mutual interactions during a school day. Within an effective assessment process, the teacher applies practices of effective intervention at the classroom level, increases the probability of having positive teacher-student interactions and of promoting learning and student involvement, enhancing objective and effective assessment and providing friendly and immediate feedback.

If the level of performance of the students is evaluated through graphic organizers as an alternative assessment method, conceptual maps, cluster, Venn diagrams, Ishikawa diagram, providing feedback from the teacher is more rapid, prompt, as graphic organizers facilitate rapid assessment, thus communicating results to the students in a proper manner.

For pupils, teacher's feedback is crucial, with emotional load. Therefore, the adequacy and comprehension are *sine qua non* characteristics that are followed within the evaluation process. And when the primary school teacher conducts assessments through graphic organizers, it is necessary to provide fast and efficient feedback, with a constructive role for pupils' learning, to continuously monitor their development and progress.

### *Feedback centered on students' progress*

When feedback aims at the students' progress, students find answers to the following questions concerning the progress they make: "Am I on the right track?"

What can I improve? What do I do well? How Am I generally speaking?" (Feedback at <http://iteach.ro/pagina/1142/>).

Feedback focused on progress makes the student capable of self-assessment and self-monitoring, highlight aspiration and be satisfied with his/ her own evolution. By allocating time for talking to the student, giving constructive criticism, the teacher will have a strong impact on the learning process.

#### *Formal and informal feedback*

In relation with the students, the teacher can provide formal and informal feedback. Formal situations take the shape of official meetings, conferences, olympiads, contests, when the teacher and students work together to fulfill some established objectives and for which they are assessed and appreciated.

Informally, the teacher makes judgments on students' activity when passing by the students' desks, when making an instant suggestion, and students can correct and rectify the situation.

#### *Feedback centered on errors and progress monitoring*

When referring to error correction and progress monitoring, feedback should:

- assist students in learning the right answers in a short time;
- be specific and adapted to the level of knowledge, skills and abilities of the students;
- occur as a consequence of the student's mistake (namely a correction of errors).

#### *Effective feedback*

Feedback provided to students is efficient, if after the assessment process based on graphic organizers, it aims to:

- "Be corrective by its nature (feedback should provide the students with an explanation of the reasons according to which what they do is right or wrong);
- Take place in the right time (to be offered immediately after teacher's appreciation);
- Be specific to a criterion (within assessment, the teacher reports to criteria to establish a specific level of competences or knowledge);
- Allow students to give their own feedback (students should be capable of monitoring their own progress through self-assessment based on feedback received from the teacher)" (Feedback at <http://iteach.ro/pagina/1142/>).

Effective feedback "can take many forms (e.g. answering questions, checking the static activities and direct answers), and researchers have found positive links between it and involvement or students' achievements (...) when teachers use error correction, there are improvements in academic achievement (Barbetta, Heron, & Heward, 1993; Barbetta & Heward, 1993) and in right answers" (Bangert-Downs, Kulik, Kulik & Morgan, 1991, Maureen A. et. al., 2010, p. 8 *apud* Pânișoară, 2004, p. 54, our translation).

Corrective feedback must accompany the ongoing monitoring of academic performance and / or social (such as curriculum-based assessment), but also accurate and consistent training and intervention (their implementation with consistency).

Whatever form is offered (formal and informal), feedback will maximize the students' progress, enhancing their self-confidence, providing new contexts of knowledge and positive and active – participatory learning.

### Conclusions

Due to the omnipresence of information, communicative competence / accurate data interpretation is necessary to ensure that students do not simply accept everything that is said or shown. Howard Wainer, 1990 (*apud* Collins, 2004, p. 6) emphasizes, in this regard, that "representation of data in a graph allows students to discover patterns and recognize the meaning of the data that could not be seen easily in a spreadsheet or text. Graphs can easily display items that could not be seen otherwise".

This gives an indication of the functional relationship between metacognition as a process of educational path and graphic organizers as tools to facilitate learning within this route. Graphic organizers are integrated in a teaching approach based on meta-learning and metacognition is realized as far as knowledge is facilitated fully and consciously through effective communication.

The curriculum – frame supports of cognitive and metacognitive mechanisms for training and skills development for life and educational contexts.

To justify the skills - capabilities - graphic organizers relationship, we mention that graphic organizers, as assessment tools are designed to engage students actively in their own learning, to build capacities, general and specific skills, as required by the curricula.

We support the idea of an emerging relationship between skills – competences and graphic organizers in the context of effective classroom communication.

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