



Possibilities for improving the learning to learn competency of students from technical schools - results of an experimental research

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Abstract

Keywords:

learning to learn competency;
learning difficulties;
critical reflection;
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strategic decisions making;

We made the transition from an industrialized era to an era of knowledge, putting more and more emphasis on the ability to learn effectively, to be flexible and to adapt to the changing society of knowledge. The ability to learn faster and better than others has become crucial for welfare. Since this is one of the formalized eight European key competences, the formal pre-university education should provide a proper learning environment in order to develop this competence to all students. In this study, we propose to evaluate the impact of the intervention program centered on an operational model of development of learning to learn competency in order to diminish the frequency of learning difficulties in studying Romanian language and literature so that the learner reaches the authentic, reflexive and strategic learning. The sample of subjects includes 106 students from technical high schools and colleges whose limits are situated mainly in the direction of efficiently managing the cognitive, metacognitive, emotional and motivational resources. We used an experimental inter-subject design, using sample / unique group technique, as the same single group of students with learning difficulties was pursued at different stages and its evolution had analyzed. Finally, we analyzed the results of research that open wide possibilities for structured pedagogical actions which aim to stimulate critical reflection, metacognitive reflection and strategic decisions making.

Zusammenfassung

Schlüsselworte:

das Lernen lernen Kompetenz;
Lernschwierigkeiten;
kritische Reflexion;
metacognitive Reflexion;
strategische Entscheidungsfindung;

Wir haben den Übergang von einer industrialisierten Zeit zu einer Ära des Wissens gemacht, mit mehr Wert auf die Fähigkeit, effektiv zu lernen, flexibel zu sein und a den Änderungen der Wissensgesellschaft anzupassen. Die Fähigkeit, schneller und besser als die anderen zu lernen ist von entscheidender Bedeutung für das Wohl. Als eine der acht Schlüsselkompetenzen, die auf europäischer Ebene formalisiert ist, muss die formale voruniversitäre Bildung eine förderliche Lernumgebung für die Entwicklung dieser Fähigkeit bei allen Schülern anbieten. In dieser Studie schlagen wir uns vor, die Auswirkungen eines Interventionsprogramms, das auf ein operatives Modell für die Entwicklung der Kompetenz das Lernen lernen konzentriert ist, zu bewerten. Das Interventionsprogramm soll auch die Verringerung der Häufigkeit den Lernschwierigkeiten in rumänischer Sprache und Literatur ursachen, so dass die Schüler nach authentischem, reflektierendem und strategischem Lernen streben. Die Teilnehmer an dieser Studie sind 106 Schüler von Hochschulen und Fachhochschulen deren Grenzen in erster Linie auf eine effiziente Verwaltung den kognitiven, metakognitiven, emotionalen und motivationalen Ressourcen liegen. Wir verwendeten ein experimentelles interindividuelles Design, die Technik der einzigartige Gruppe; ein und dieselbe Gruppe von Schülern mit Lernschwierigkeiten wurde in verschiedenen Phasen verfolgt, um ihr Evolution zu analysieren. Schließlich analysieren wir die Ergebnisse der Forschung, die zahlreiche Möglichkeiten für strukturierte Bildungsaktivitäten eröffnen. Diese Aktivitäten zielen darauf ab, die kritische, metacognitive Reflexion und die strategische Entscheidungsfindung zu stimulieren.

1. Paper Rationale

We made the transition from an industrialized era to an era of knowledge, putting more and more emphasis on the ability to learn effectively, to be flexible and to adapt to changing knowledge society. The ability to learn faster and better than others has become crucial for welfare. The sum of knowledge, skills and attitudes make up an individual's competency. This represents a set of knowledge, skills and attitudes that individuals appropriate them and prove their effectiveness in a particular context leading to results. Competency-based learning is built on a system of teaching and learning that constantly develops students' autonomy and learning to learn ability. Thus, students become real organizers of their own learning and therefore need motivation and supervision, as well as the development of cognitive strategies and goals that will help them learn and reflect on their learning. Learning difficulties are temporary obstacles in learning activities that affect the input of information, their processing and the output of process, both in terms of cognitive and metacognitive, in the case of persons who have basic intellectual capacities in terms of structural and functional integrity. Therefore, developing the learning competency at students with learning difficulties is an important pedagogical stake.

2. Paper theoretical foundation and related literature

Nowadays the concept of competency is a point of reference, with major success in explaining, appreciation, evaluating and adjusting a varied registry of social activities; competency constitutes an individual or collective feature to select, mobilize, combine and use efficiently in a given context, a system, an integrated assembly of knowledge, skills and attitudes and to resolve successfully certain tasks. One of the shorter and more operational definition of competency describes competency as dynamic or potential knowledge that can be mobilized in a large number of different or similar situations, by mobilizing *savoir-dire*, *savoir-faire*, *savoir-être* (Minder, M., 2011). Constructivist approaches and interpretations (Eraut, 1995; Dall'Alba and Sandberg, 1996; Stoof et al., 2002; Sandberg and Pinnington, 2009 apud Ripamonti, S., Scaratti, G., 2011, Andronache, D., 2013) believe that qualitative manifestation of competency is directly influenced and dependent on the contextualized experiences that individuals are living. It is not only the context that can influence the quality of the competency manifestation, but also subjective experiences of individuals, determined by context. Therefore, the definition of competency should be guided by the context and by the area in which it manifests itself. The acquisition, modeling and

development of competencies are an ongoing and graduated process, since, on the one hand, the knowledge and abilities held by an individual evolve, consolidate and enrich continuously and, on the other hand, they are reorganized, restructured and permanently transformed into integrated assemblies, gaining a growing degree of complexity (Peculea, L., 2015). Regarding the educational field, the current direction of education towards the concept of competency is the effect of a deeper reflection on the psychological complexity of knowledge in general and of learning in particular, in order to find new resources to improve the instructional and educational approaches. So, Therefore, there is a great variety of perspectives to define competence which may lead to the risk of confusion among both experts, responsible for the design of educational programs based on training and competence development, but also among practitioners, those who implement competency-based training programs (Andronache, D., Bocoş, M, 2015).

The pedagogical issue of competencies is combined with lifelong education. According to the definition given by the EU Commission (2000), lifelong learning includes all activities directed towards a specific purpose, whether formal or informal, undertaken on an ongoing basis, with the aim to improve the knowledge, skills and competencies. The idea of lifelong learning is comprehensive and covers the entire life of an individual („from the bud and to the grave "). Lifelong learning is defined as „intentional learning where people engage throughout their lives for personal and professional fulfillment and for improving their quality of life" (Dunlap, J.C., Grabinger, S., 2003). Educators play a critical role in the complex process of students' development as lifelong learners.

In this context, learning to learn is an essential tool for lifelong learning. Therefore, education and training have to secure the learning environment in order for this competency to be developed for every citizen. "Learning to learn" is one of the desirable competencies proposed by EU for citizens. The expression "learning to learn" is accompanied by four goals of the present school: learning to know, learning to do, learning to live together, and learning to exist (Delors, J., 2000). Therefore, the Romanian school must become the school of innovative learning and in depth learning (Chiş, V., 2005), a school of forming and developing the competencies. In this paper we choose the definition of the European Union (European Commission, 2006), which supports the existence of three structural dimensions of learning to learn competency: cognitive, metacognitive and emotional and motivational dimensions combined with socio-cultural learning environment. Thus, according to Hoskins and

Fredriksoon (2008), the concept of learning to learn is studied in order to consider an European framework and to test the measurement of the "learning to learn" expression. The definition emphasizes that this combination of capacities must be used in multiple and different contexts by people who have gained them and, thereby, reference is made to the fact that this competency is rather a general one than one related to a specific study discipline. Being a transversal type of competency, the learning to learn competency could not be attached strictly to just one discipline from the curriculum at the pre-university level. Thus, learning to learn competency could be developed either by a self-standing approach, based on learning the techniques, the methods and learning strategies, independent from the traditional disciplines or by means of infusion in disciplinary or inter-disciplinary approaches, therefore contributing to the development of other key-competencies and becoming a result of the latter.

The contemporary school is a school of great individual diversity, which tends to be a school for all - an inclusive school, therefore, the categorization of the learning difficulties should reflect this diversity as well as the diversity of the educational support that students need. Among the causes of learning difficulties, recent specialist studies attribute a great importance to social factors, so that school difficulties are manifested in school requirements and a certain context, the school context, becomes important (Cairo, M., 2008). Students who don't have specific learning difficulties don't manifest specific disorders, but they are slower, less strategic, generalize less knowledge and have more difficulties to connect tasks as a consequence of the fact that they don't transfer learning strategies (Bosson, M., 2008), that metacognitive skills are low level for this students (Borkowski et al., 2000; Fuchs et al., 2003; Wong, 1994; Björklund, 2005) or they are trying to compensate for difficulties, overusing the ones they are most familiar (Saint-Laurent et al., 1995 cited Vianin, P., 2011).

We say that learning is strategic when the learner is conscious about the process of learning and is controlling his/her efforts in using certain personal habits and strategies (Paris, Lipson and Mixson, 1983 apud Vianin, P., 2011). According to Butler (1998), strategic learning involves "a recursive cycle of cognitive activities, including tasks analyze, selection, adaptation or invention of strategies, monitoring performance as well as changing approaches that are needed". Therefore, effective strategic learning should promote all these activities cognitive, as well as motivational and emotional processes. Since many of the learning experiences are unplanned and experiential, the key for an effective learning is reflection that transforms experiences in learning. The reason that some

people are poor reflective learners is because they have a limited repertoire of reflective questions research. Its importance, however, is in providing opportunities to practice them. Reflective learning does not represent what happens with the learner, it represents what the learner does with what happens to him. Reflection helps learners to link new learning experiences to previous ones, so that they can assimilate unknown, particular items, in a holistic and wide-range learning (Jordi, R., 2011).

Learning is enhanced by *critical reflection* which involves "creating the meanings and conceptualizing from experience" (Brockbank and McGill, 1998). As educators, we need to facilitate critical reflection to allow students to go beyond a superficial understanding of their world toward a deeper and meaningful learning. Trilling and Fadel (2009) define critical thinking as "the ability to analyze, interpret, evaluate, summarize and synthesize information" (Pacific Policy Research Center, 2010, p. 7). According to Candy, Harri-Augstein and Thomas (1985), *metacognitive reflection* is "a specific approach which allows students to analyze their own learning process in a systematic manner and to discover their personal hypothesis and constructions of what they are producing as a way for students to identify and question their own strategies." Metacognitive reflection implies the evaluation, monitoring and control of personal cognition or mental functioning (Flavell, 1979; Jost, Kruglanski și Nelson, 1998; Metcalfe și Shimamura, 1994). Reflection offers students the context in which they use their *ability to make decisions* when analyzing their own performance, as well as their colleagues' performance, questioning what they have learnt and making decisions regarding the possible alternatives of the problem in question. Being able to take informed decisions by considering the positive and negative consequences of actions and selecting the most suitable option is an important skill for promoting effective learning. A high level of control can lead to increased motivation and interest, giving students the opportunity to exercise control over their learning and to involve them in decision-making processes (Alexander, Jetton, 2003; Moos, Azevedo, 2008 apud Azevedo, R., Aleven, V., 2013).

3. Methodology

Our work aims to be the result of a research effort whose theoretical and methodological premises will become the starting points for formulating landmarks of the design work regarding the improvement of learning activities to students. Therefore, *the main aim* of this research is to stimulate the development of learning to learn key-competency by means of implementing an intervention program to 11th grade students

with learning difficulties in studying Romanian Language and Literature, so that the learner reaches the authentic, reflexive and strategic, efficient, autonomous/independent learning based on comprehension. The research that we suggest has as a **general objective** the elaboration and implementation of a formative intervention program centred on an operational model of development of learning to learn competency at cognitive, metacognitive and non-cognitive levels, for 11th grade students with learning difficulties in studying Romanian language and literature.

Starting from the identified problems in the analysis of the school results of 11th grade students, and on their learning difficulties, we have elaborated the following **hypothesis of the research**: *The implementation of an educational intervention program to 11th grade students in order to value entirely, in personalized manner and in a socio-constructivist framework the critical reflection, the metacognitive reflection and the strategic decisions making, will diminish the frequency of learning difficulties in studying Romanian language and literature.*

The **sample of subjects** included within the observational research was a number of 186 teachers and 560 students from 8 technical high schools and colleges from Cluj-Napoca. After coding the names of students, interpreting the results of pre-test evidence and analyzing the school results in Romanian language and literature discipline were included in the unique experimental group a sample of 106 students from 11th grade with learning difficulties from three technical high schools and colleges. Thus, the sample of subjects gathers students whose limits are situated mainly in the direction of efficiently managing the cognitive, metacognitive, emotional and motivational resources. So we used an experimental inter-subject design, using sample / unique group technique, as the same single group of students with learning difficulties was pursued at different stages and its evolution had analyzed. One of the first directions of sample content formation was the identification of the themes and contents that were to be included in the experimental approach. The contents were chosen according to the specific program from the curricular area Counseling and Orientation for 11th grade. A second direction of sample content formation was the decision regarding the strategic and reflexive processes and behavior that were to be practiced during the intervention.

The behaviors frequency of using the critical thinking abilities when studying the Romanian language and literature (critical reflection) was measured by **Motivational Strategy Learning Questionnaire (MSLQ)** developed by Pintrich, Smith, Garcia and McKeachie, 1991 (critical thinking subscale) translated

and adapted by us. From the repertoire of methods for assessing metacognition in school learning, available in literature, we selected the scale developed by G. Schraw and RS Dennison (1994) and named by the authors **Metacognitive Awareness Inventory (MAI)** (translated and adapted by A. Glava, 2007), that we decided to use in pre-test and post-test phases of this investigative approach. Another instrument used to measure strategic decisions making was **Metacognitive Awareness of Reading Strategies Inventory (MARS)** created by Mokhtari and Reichard, 2002, problem-solving strategy subscale, translated and adapted by us for measuring the degree of practicing the problem-solving strategies in reading texts. Both of the psychometric qualities of the instruments produced in their original form translated and adapted for the Romanian school population and achieving significant correlations between the variables represented the interest points in the pilot study of instruments.

4. Results

In the pre-test phase we used the analysis of global average scores and on subscales of questionnaires/inventories applied. Thus, we calculated the means of the scores by summing the scores obtained by subjects and calculating the arithmetical mean of the scores for the entire sample of subjects, students with learning difficulties. Also, we were interested in analyzing the way in which the three variables correlate to each other. At the end of the pre-test phase, the results indicated that the experimental group contains an impressive number of students who cannot regulate their strategic and reflective behavior in learning or who can only succeed at a medium level. Descriptive statistical analysis performed indicates that there is a predominance of low scores on metacognitive reflection variable before starting the experiment. Also, students have shown a slightly low level of decisions making abilities regarding learning strategies in reading situations. Subjects were unaware of the intrinsic value of learning, their usefulness, considering they have low effectiveness of reflective and strategic abilities.

For determining the existence of certain differences between the three variables within the experimental group we have used Paired-Samples T Test in order to compare the means. Considering the statistical data, we can assert that the average level of the critical reflection development during the post-experimental stage ($M = 5,02$, $AS = 0,73$) is significantly higher ($t = -18,52$, $df = 105$, p bidirectional $< 0,005$) as opposed to the average level of the critical reflection development during the pre-experimental stage ($M = 4,12$, $AS = 0,67$). Test t data shows that there is a significant difference

between the average scores obtained by the subjects during the pre-testing and post-testing stages. In order to identify the degree of impact of this difference we have calculated Cohen's d coefficient based on test t value for pair samples (having dependent scores). After calculating d Cohen (d

Cohen = 5,79, r = 0,94), we can conclude that there is a strong effect due to our intervention regarding the development of critical reflection during the post-experimental stage as opposed to the pre-experimental stage.

Table 1. The results of test t for the experimental group regarding the critical reflection during the pretesting and posttesting stages

	Paired Samples Test							
	Mean	Std. Deviation	Std. Error Mean	Paired Differences		t	df	Sig. (2-tailed)
				95% Confidence Interval of the Difference Lower	Upper			
CR_pretest & CR_posttest	-0,90000	,50010	,04857	-0,99631	-0,80369	-18,529	105	,000

In the case of metacognitive reflection, we can conclude that the average level of its development during the post-experimental stage (M = 4,05, AS = 0,44) is significantly higher (t = -51,21, df = 105, p bidirectional < 0,005) as opposed to the average level of metacognitive reflection development during the pre-experimental stage (M = 3,02, AS = 0,45). In what concerns the increase of the effect size regarding metacognitive reflection, Cohen's d coefficient, d = 7,03, meaning for a r = 0.96 represents a powerful effect of our intervention.

Table 2. The results of test t for the experimental group regarding the metacognitive reflection during the pretesting and posttesting stages

	Paired Samples Test							
	Mean	Std. Deviation	Std. Error Mean	Paired Differences		t	df	Sig. (2-tailed)
				95% Confidence Interval of the Difference Lower	Upper			
MR_pretest & MR_posttest	-1,02094	,20523	,01993	-1,06047	-,98142	-51,217	105	,000

Corroborating data from descriptive statistical analysis with the T test-pairs values, we can state that the average level of the strategic decisions making process development during the post-experimental stage (M = 4,21, AS = 0,48) is significantly higher (t = -37,95, df = 105, p bidirectional < 0,005) as opposed to the average level of the strategic decisions making process development during the pre-experimental stage (M = 3,10, AS = 0,56). We also mention that in the case of the strategic decisions making development, our intervention had a strongly significant effect (d Cohen = 5,10, r = 0,93).

Table 3. The results of test t for the experimental group regarding the variable of strategic decisions making during the pretesting and posttesting stages

	Paired Samples Test							
	Mean	Std. Deviation	Std. Error Mean	Paired Differences		t	df	Sig. (2-tailed)
				95% Confidence Interval of the Difference Lower	Upper			
SDM_pretest & SDM_posttest	-1,10877	,30074	,02921	-1,16669	-1,05085	-37,958	105	,000

These results demonstrate that during the experimental approach, because of exercising critical reflection, metacognitive reflection and strategic decisions making in complex learning situations, there has been a significant

increase in the incidence of learning behaviors, of cognitive, metacognitive, non-cognitive dimensions, an optimization of awareness, planning, monitoring and control of learning.

Intending to identify the degree of correlation between the three variables regarding the development of learning to learn competence during the post-testing period, we have used Pearson's correlation coefficients. Thus, after the data analysis we can notice that between the three processes contributing to the development of learning to learn competence, there are significant positive correlations ($p < 0,001$). Therefore, the

level of development of critical reflection positively correlates with the level of metacognitive reflection at a $r = 0.78$ and with that of strategic decisions making at a $r = 0.80$. Also, the level of the development of metacognitive reflection positively correlates with the level of strategic decisions making at a $r = 0.76$.

Table 4. Correlations obtained between the three variables in the posttest phase

		Critical reflection	Metacognitive reflection	Strategic decision-making
Critical reflection	Pearson Correlation	1	,786**	,809**
	Sig. (2-tailed)		,000	,000
	N	106	106	106
Metacognitive reflection	Pearson Correlation	,786**	1	,760**
	Sig. (2-tailed)	,000		,000
	N	106	106	106
Strategic decision-making	Pearson Correlation	,809**	,760**	1
	Sig. (2-tailed)	,000	,000	
	N	106	106	106

** . Correlation is significant at the 0.01 level (2-tailed).

In other words, the average values in the applied inventories are significantly higher in posttest for each of the three variables that contribute to the development of learning to learn competency, than the values obtained in applying the same inventories in the pretest phase. In the same vein, the correlations between the three variables are kept positive and become significantly stronger in posttest. Also, we mention that although the correlation coefficients do not have an equal value with 1, although they do not indicate a perfect correlation between the variables, these correlations are significant. Moreover, the development of a competence and its structural components happens in time therefore we expected an unequal correlation between critical reflection, metacognitive reflection and the process of strategic decisions making. Thus, the existence of certain significant correlations between these components, although not perfect, intends to complete the rest of the statistical data and emphasizes the efficiency and functionality of our model for developing the learning to learn competence.

5. Discussions

In the pre-testing stage, analysis of mean scores obtained for the three categories of variables and their correlation with the global scores mean obtained by all subjects at administered inventories allow us to observe that the critical reflection variable is above the group mean (4.12), with a score higher than the mean (3.11), while the metacognitive reflection variable is slightly situated below the group mean (3.02). This means that students' cognitive approaches are more valued in educational practice than the metacognitive ones focusing on observation of the learning process. Scales and subscales data allow us to focus on the trends in the processes of critical reflection, metacognitive reflection and strategic decision making with the advancement in the intervention program. Thus, statistical data was found between the three processes that contribute to the development of learning to learn competency, as between critical reflection, metacognitive reflection and strategic decision-making there are significant, but not strong correlations ($p < 0.001$). To represent the data included in the correlation coefficients, mentioned above, we

realized specific scatter diagrams, stating that there is no evidence of a curvilinear relationship or undesirable influence of aberrant values.

The statistically significant differences between the results obtained from the practice activities during the pre-testing and post-testing stages along with the evolutions emphasized during the formative intervention by means of qualitative and quantitative tools, allow us to appreciate the hypothesis that stood at the basis of this experiment as being validated. Using critical reflection, metacognitive reflection, strategic decisions making and involving subjects in complex learning situations in an intervention program articulated proved their formative efficiency in the sense of activation and optimization learning behaviors and, consequently, a decrease of learning difficulties faced by 11th grade students.

The findings regarding the hypotheses confirmation are based on the comparative results of the experimental group before and after intervention. These results have shown, based on t-test and Cohen's d coefficient, which measures the effect size, the pattern of development of learning to learn competence, proposed by us, is functional, causing superior results to the experimental group in the two points of intervention. Also, based on Pearson correlations, which proved to be positive, significant, it can be concluded that between critical reflection, metacognitive reflection and strategic decisions making, being promoted by the development model of learning to learn competence, there are interrelations and interdependencies. Thus, the students in the experimental group with a high level of critical reflection have a high level of metacognitive reflection and also a high level of strategic decisions making and vice versa, as well as the students with a high level of metacognitive reflection have also a high level of strategic decisions making and vice versa. Positive correlations between the three variables obtained in pre-test phase maintained to post-test phase, even more, they become highly statistically significant. Examining the scatter diagrams on relations between critical reflection and metacognitive reflection, between critical reflection and strategic decision-making and between metacognitive reflection and strategic decision-making, we can say that there is no evidence of a curvilinear relationship or undesirable influence of aberrant values.

Experimental results validate the effectiveness of the model, but we must admit that they aimed only to stimulate critical reflection, metacognitive reflection and strategic decisions making; the generalization of this model based only on these variables is not sufficient to develop the learning to learn competency. Our intervention has allowed each student with

learning difficulties, on the one hand, and the group itself, on the other hand, to evolve in terms of the orientation of cognitive interests, the search for answers to complex questions, the analysis and synthesis of information and opinions, ensuring to understand the new and the learning, achieved in a broad sense as approach that goes beyond school and classroom space in the context of life situations of students with learning difficulties.

6. Conclusions

Intending to improve dysfunctional aspects related to learning processes, the educational research undertaken in the development of learning to learn competence aimed to argue and demonstrate the importance and necessity for experimental intervention focused on developing learning to learn competence to students with learning difficulties from 11th classes in the context of studying the Romanian language and literature. At the same time, we believe that the research carried out is a pleading for shifting the emphasis from teaching to the learning, from informative side to formative one, thus contributing scientifically to improve the educational process. We also believe that the results of the experimental approach, which was to implement an intervention program that values entirely critical reflection, metacognitive reflection and strategic decisions making within a socio-constructivist framework, demonstrate that the development of learning to learn key-competence is a viable solution for improving students' learning, their learning autonomy and responsibility, for optimizing strategic and reflective learning.

References

- Andronache, D., Bocoş, M.. (2015). *A systemic-interactionist model to design a competency-based curriculum*. In *Procedia. Social and Behavioral Sciences*. Philadelphia: Elsevier
- Andronache, D. (2014). *Proiectarea curriculară centrată pe competențe. Perspective analitice și investigative*. București: Editura Universității din București
- Azevedo, R., Aleven, V. (2013). *International Handbook of Metacognition and Learning Technologies*, Springer Science-Business Media, New York.
- Bjorklund, D.F. (2005). *Children's thinking: Cognitive development and individual differences* (4th ed.). Belmont, CA: Wadsworth/Thomson Learning.
- Borkowski, J. G., Chan, L. K. S., & Muthukrishna, N. (2000). A process-oriented model of metacognition: Links between motivation and executive functioning. In G. Schraw & J. C. Impara (Eds.), *Issues in the measurement of metacognition* (pp. 1-42). Lincoln: Buros Institute of Mental Measurements.
- Bocoş, M.-D. (2013). *Instruirea interactivă*: Iași: Editura Polirom
- Bosson, M. (2008). *Acquisition et transfert de stratégies au sein d'une intervention métacognitive pour des élèves présentant des difficultés d'apprentissage*, Thèse de doctorat: Univ. Genève, Available at: <http://archive-ouverte.unige.ch/unige:80>
- Brockbank, A. & McGill, I. (1998). *Facilitating Reflective Learning in Higher Education*. Maidenhead, Society for Research in Higher

- Education and Open University.
- Butler, D. L. (1998). The Strategic Content Learning approach to promoting self-regulated learning. In B. J. Zimmerman, ed. & D. Schunk (Eds.), *Developing self-regulated learning: From teaching to self-reflective practice* (pp. 160–183), New York: Guilford.
- Cairo, M. (2008). *Problemi di apprendimento a scuola: disabilità, difficoltà, svantaggi e dotazioni. Percorsi di pedagogia e didattica speciale*, Vita e Pensiero, Milano 2008: 278 [http://hdl.handle.net/10807/3426].
- Candy, P., Harri-Augstein, S., Thomas, L. (1985). Reflection and the self-organized learner. In Boud, D., Keogh, R., & Walker, D., *Reflection: Turning experience into learning*. New York: Kogan Page.
- Chiș, V. (2005). *Pedagogia contemporană-pedagogia pentru competențe*, Editura Casa Cărții de Știință, Cluj-Napoca.
- Delors, J. (2000). *Comoara lăuntrică*, Editura Polirom, Iași.
- Dunlap, J. C., Grabinger, S. (2003). Preparing students for lifelong learning: A review of instructional features and teaching methodologies, *Performance Improvement Quarterly*, 16(2).
- Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive-development inquiry. *American Psychologist*, 34(10), 906-911.
- Fuchs, L. S., Mock, D., Morgan, P. L., & Young, C. L. (2003). Responsiveness to intervention: Definitions, evidence, and implications for the learning disabilities construct. *Learning Disabilities and Practice*, 18, 187–200.
- Glava, A. (2009). *Metacogniția și optimizarea învățării. Aplicații în învățământul superior*, Editura Casa Cărții de Știință, Cluj-Napoca.
- Hoskins, B., Fredriksson, U. (2008). *Learning to Learn: What is it and can it be measured?* Joint Research Centre – Institute for the Protection and Security of the Citizen, Luxembourg: Office for Official Publications of the European Communities, CRELL.
- Jordi, R. (2011). Reframing the Concept of Reflection: Consciousness, Experiential Learning and Reflective Learning Practices, *Adult Education Quarterly* 61(2) 181–197, at <http://www.sagepub.com/journalsPermissions.nav>
- Jost, J. T., Kruglanski, A. W., & Nelson, T. O. (1998). Social metacognition: An expansionist review. *Personality and Social Psychology Review*, 2, 137-154.
- Metcalfe, J., & Shimamura, A. P. (Eds.). (1994). *Metacognition: Knowing about knowing*. Cambridge, MA: MIT Press.
- Minder, M. (2011). *Didactica funcțională- obiective, strategii, evaluare. Cognitivismul operant*, Editura ASCR, Cluj-Napoca.
- Peculea, L. (2015). *Dezvoltarea competenței de a învăța să înveți. Aplicații la elevii cu dificultăți de învățare*, Editura Casa Cărții de Știință, Cluj-Napoca.
- Ripamonti, S., Scaratti, G. (2011). Weak knowledge for strengthening competences: A practice-based approach in assessment management, *Management Learning*, no.43.
- Trilling, B., and C. Fadel. 2009. *21st century learning skills*. San Francisco, CA: John Wiley & Sons.
- Vianin, P. (2011). *Ajutorul strategic pentru elevii cu dificultăți școlare*, Editura ASCR, Cluj-Napoca.
- Wong, B. Y. L. (1994). Instructional parameters promoting transfer of learned strategies in students with learning disabilities. *Learning Disability Quarterly*, 17, 110-120.
- ****Mémorandum sur l'éducation et la formation tout au long de la vie*. (2000). Commission européenne, Direction générale de l'Education et de la Culture, Document de travail des services de la Commission, Bruxelles.
- ***Pacific Policy Research Center. (2010). *21st Century Skills for Students and Teachers*, Honolulu: Kamehameha Schools, Research & Evaluation Division.
- ****Reccomendation of the European Parliament and the Council of 18 December 2006 on key competences for lifelong learning*. (2006). Education Council, Official Journal of the European Union, Bruxelles.

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