CRITERIA FOR ELEARNING PROGRAMMES EVALUATION

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Abstract*: Recent concerns of educational policy level exercise a certain pressure on evaluations of educational programs to provide concrete results, comparable, usable to define the most appropriate strategies for development of education. Debates at this level, which need evidences extracted from existing evaluation research reports, are concerning important topics regarding the relationship with new technologies such as: the emergence of a increasingly pronounced digital divide, the need to promote and support the set of skills for 21st Century, as well as the "insufficient experience of radical change in education", computer-assisted instruction being regarded as "the vanguard of the knowledge society". An important point in continuing this synthetic and general perspective refers to the fact that there are no solutions or "magic" ideas to operate independently of context. Therefore, the principles and suggestions in this article be taken as such and customized according to the level at which the program is implemented, the concrete needs of the target group, type of intervention chosen, the particular education system or targeted curriculum, the results of other complementary programs etc. Such an approach towards a methodological construction is useful as well for the design stage of eLearning programmes, in the actual context of multiplication of initiatives aiming at incorporating new technologies to increase performance and quality of education. The article highlights a number of useful aspects for a better evaluation of elearning programs, starting from the preparedness of the target groups and institutions, then focusing on the object of evaluation, the expected results, the indicators and instruments used in evaluations.*

Keywords: *elearning programmes, programme evaluation, CAI*

I. SUPPORTING INITIATIVES THROUGH RESEARCH AND EVALUATION

The programs introducing elearning activities at national, regional, institutional level or sectoral (on a component of the education system) have revealed the need to support them by continuing research at the confluence of information technologies and training activities, as well as to monitor and to evaluate the programs initiated. A review of the main problems in the area of elearning helps us get an idea about the complexity of this phenomenon, so far insufficiently explored. Regarding the instructional design, we have: specific instruction models, the types of content that is suitable for transfer to electronic media, the ways to structure their visual design, learning styles, the student-content interaction modes, the standards. In terms of organization and development process of elearning, we could talk about: specific teaching methods, skills of the education actors, class organization, effective ways of interaction between students and between tutors and students, assessing their learning progress, control over content, quality assurance, and the monitoring system. In addition, correlative aspects of the education process, concerning the outcomes in terms of human resources prepared and the skills of graduates, bring to the education area topics such as ensuring access to technologies and training of digital skills, extended to elements such as the most appropriate type of IT equipment, quantity, quality and opportunity of educational software required for school,

curriculum for initial and continuing training of teachers, institutional strategies to incorporate administrative and pedagogical practices that use new technologies [17].

This is why any approach towards a set of recommendations for elearning programs and projects can remain on a general level attempt to target all aspects listed above. An important point in continuing this synthetic and general perspective refers to the fact that *there are no solutions or "magic" ideas to operate independently of context*. Therefore, the principles and suggestions in this article be taken as such and customized according to the level at which the program is implemented, the concrete needs of the target group, type of intervention chosen, the particular education system or targeted curriculum, the results of other complementary programs etc.

The complexity of the design process of adequate evaluation methodologies leading to conclusive and comprehensive results regarding the use of ICT in education lies not only in the complexity of the domain, but also in the limitations of current means of (comparative) evaluation [16]. Isolating the effects produced by ICT from other influences is difficult to make, given that there are still steps to go to achieve an acceptable level of completeness and quality of the measurement indicators of the digital skills needed in the knowledge society, of the efficiency of an education institution, of the outcomes of a teacher training program, of the effects of curriculum changes, of the differences between education systems in terms of performance.

1.1. A multi-level approach to elearning programs

More and more works identify about five dimensions of policies that are essential for the transition to a paradigm of education for the XXI Century; according to some authors, they are: curriculum, pedagogy, evaluation, professional development of teachers, and school organization. Strictly referring on the professional training system, a UNESCO study [5] examines five aspects that require careful consideration when making a decision whether to introduce elearning or not, whether at national or institutional level:

1. *Infrastructure*: there must be a proper infrastructure to ensure equity of access and adequate presentation of content.

2. *Administration*: the system must provide the necessary resources and support for. technology integration.

3. *Education process*: ICT must be used to improve teaching and learning.

4. *Teacher training*: Teachers should be well prepared to use ICT in teaching and facilitate learning.

5. *Content*: Content development can be costly and time consuming, and the contents may have a reduced life.

Regardless of the number or components identified, the need to harmonize interventions at various levels is exactly highlighted in the recommendations of a impact evaluation report on implementing a training program for teachers in Romania. The course aimed to develop competences to use ICT in educational situations in the classroom, in a well defined pedagogical context. Aiming as well to reveal the current conditions in which participants applied in the classroom what they learned, the authors of the study noted in the concluding chapter that: "*Processes of successful implementation of new technologies are conditioned by the following factors: favorable organizational conditions (pedagogical vision, education policy, and school culture); transparent collaboration between different professional groups (teachers, management team, technical department etc.); suitable material conditions (infrastructure, materials).*" [13]. In support of this idea, we can see that some conclusions of the recent studies are formulated nuanced, and the emphasis remains only partially on technology, much of the observed benefits being put in a significant extent as due to other conditions: "*ICT has increased the effectiveness of planning and instruction due to the collaboration among teachers*" [2].

In addition, incorporating an evaluation component is required since the design stage of an elearning program. Most current evaluations are not part of the program, being attempts to disclose specific aspects, of interest to donors or companies that want to develop education software applications. The programs still having an evaluation component are to a large extent comprising only a periodic check of the timing of planned phases and a final estimate of the immediate impact, most often at the level of satisfaction of beneficiaries. **Too few programs include thorough monitoring,**

an impact evaluation component for the medium and long term, or comparative research of results, this having a negative influence upon the ameliorative steps to go, and upon the efficiency and effectiveness of future programs [17].

However, we believe that the issues covered by the evaluations carried out in recent years begin to shape the evolution of elearning domain, being a good indicator for areas of interest of policy makers, researchers, education practitioners, and other stakeholders - companies that develop educational applications, companies interested of the graduates' performance level, parents and students.

An elearning program elaboration requires a comprehensive perspective that would allow envisagement of the effects at various levels and control of these effects, in order to minimize unwanted outcomes and perverse effects. Also, for designing the evaluation (as part of the program), there is a need for contextualization, a precise definition of needs that the program aims, of the target group, of the type of intervention and available resources, as well as detailed explanations of the expected effects and possible side effects.

1.2. Readiness for implementation of elearning

An important aspect to be considered in the design and evaluation of elearning programs is the level of preparedness (readiness) of the education system to integrate ICT, essential for the success or failure of centralized elearning programs. The premise of these programs is that change will be introduced not only in some, but in all the schools in the system, according to decision-makers wish to minimize the risk of inequity and inequality between schools that use ICT and those who, for various reasons, can not afford to invest in technology.

"*The scenario that all schools will start using new technologies in a productive and effective way when teachers and students will get computers is not very realistic*", noted the authors of a recent study [11]. Rather, as regarding national reforms and programs, we are dealing with a gradual incorporation in which ICT helps teachers and students to improve teaching and learning. In this more plausible scenario, those who have adopted ICT among the first, before initiating major *top-down* programs, will soon join those of an "early majority", then the skeptics, the so-called "late majority". As teachers and students become constant users of new technologies, they gradually learn how to best use them, in other words, as they learn something new, learn new ways of learning [11]. Scenario concerns the incorporation of ICT and, consequently, change the schools in successive phases. This "cyclical mentality" (or "piston" type) is obvious as well in the most common evaluation results regarding integration and impact of ICT in school life.

In the view of the cyclical or longitudinal evaluation, the most effective approach to evaluation of major elearning programs, of national or international scale, is by using indicators.

1.3. Indicators and tools for evaluating the elearning programs

The level of sophistication of the tools necessary for a sample-based evaluation has a number of challenges regarding the rigorousness of the methodological approach, in which a first aspect consists in establishing accurate, correct and complete indicators.

In programs evaluation domain, indicators are features, landmarks or attributes that are used to measure program impact or progress towards achieving indended objectives. They are usually a predetermined set of landmarks serving to put the measurable results into categories and to guide the analysis approaches, allowing regular observation of specific characteristics and gaining a numerical expression in each round of evaluation. Defined indicators should provide information to estimate the impact or progress, but also regarding the improvement of the quality and effectiveness of program interventions operated in the program components.

Orientation towards indicator-based assessment is a newer approach in the elearning evaluation programs, structures and international bodies such as UNESCO, OECD, European Commission attempting to simplify and standardize operations to monitor and evaluate progress in the education systems in general and in the use of ICT in education.

Defined by UNESCO (2003) as measuring or assessment instruments for materials, methods, interventions, programs or projects based on the assumptions adopted in the design phase of what is relevant, the indicators used in elearning programs evaluations are both quantitative and qualitative. Another distinction is operated by the European Commission and OECD between *input indicators*, reflecting the priorities of those who defined the program or the priorities of the education system, grafted on the needs originally envisaged, *utilisation indicators*, which refers to the way teachers and students actually use new technologies, *outcome indicators*, that cover the results and their usefulness, and *learning impact indicators*, designed to measure impact on the education process (in the classroom).

UNESCO (2009, p. 18) proposed four general themes guiding evaluations of new technologies in schools: access to infrastructure, ICT usage, teacher training, and support [15]. It was as well made a distinction between indicators covering ICT that are used in evaluations, according to the scope of evaluation and how these indicators serve the purpose. If the evaluation is devoted to the elearning aspects, the ICT indicators are among the primary indicators; various other assessments dedicated to explain or reveal the effects of educational or social phenomena, but touching aspects of using new technologies for education, will use specific indicators in a particular category of four, but they are secondary indicators.

Table 1. Indicators for the introduction of ICT in education: correlation with specific dimensions pursued in four evaluation programs

Evaluation		Evaluator	Level (ISCED)	Dimensions of implementation of ICT in education			
				Access to infrastructure	ICT use	Teacher training	Support
Primary indicators	SITES (1997-2006)	Twente Univ. (Holland), Hong Kong Univ. and IEA	2 3	x	x	x	x
Secondary indicators	PISA 2003	OECD	3	x	x		
	PIRLS 2001	IEA	1	x	x		x
	TIMSS 2003	IEA	1 2	x		x	x

The distinction between primary indicators and secondary indicators of analysis is useful because is specifying the extent to which evaluators paid attention to the elearning aspects investigated - if the issues benefit of an analysis in itself or only serve for correlations and as explanatory elements for other indicators that are mainly targeted by the study. Both types of analysis equally contribute to understanding the integration of new technologies in education.

Each of these four dimensions proposed by UNESCO can be object of the designed evaluations, as far as focusing on one dimension is a condition of a measurement more accurate and efficient. On the other hand, implementation of new technologies is a process with multiple effects on all levels of educational activities, and limiting an evaluation to only one aspect - and therefore applying tools that limit or block the integrative exploration of changes and/ or their causes - can lead to the formation of a cropped image and to the formulation of limited conclusions and recommendations.

Level and modes to use new technologies in undergraduate education were the focus of a sample-based evaluation program developed by UNESCO in 1997 and lasting until 2006 - one of the first evaluations of this type and of this scale. The program called SITES (Second Information Technology in Education Studies) and consisted of a comparative type of research evaluative on the models of ICT use in education in over 40 countries. Targeted indicators were structured around the following concepts:

Table 2. ICT-related concepts / Classes of indicators (UNESCO 2009)

Concept	Description
Infrastructure	▪ Availability of ICT hardware (types of computers, local area network, Internet connections, electronic whiteboards, etc.) ▪ Availability of ICT software (general and subject specific software, learning management systems, assessment tools, etc.) ▪ Infrastructure needs and issues
Vision	▪ The vision of the school management with regard to pedagogy and ICT, covering three dimensions: traditional, lifelong learning and connectedness
Staff development	▪ Encouragement or requirements for teachers to acquire knowledge and skills with regard to pedagogical practices and the use of ICT ▪ Ways that teachers in the school have acquired knowledge and skills for using ICT in teaching and learning ▪ Availability (school-based and/or externally) of ICT-related courses
ICT support	▪ Persons involved in providing ICT support and time expenditure ▪ Extent to which pedagogical support for ICT use is available for teachers ▪ Extent to which technical support for ICT use is available for teachers

Far from complete, such an evaluative report can still provide the possibility to tint conclusions by considering a larger sample of the range of influence factors and conditions on the ground, with benefits to the level of confidence in the results and the degree of focusing on identified problems, and therefore the proposed improvement measures.

Various techniques and tools for collecting information are also used to reveal results of an elearning program, regardless of distinct dimensions which are the subject of assessment [4] [8]:

- performance of learners (by direct measurement of impact)
- curriculum (or that part which is related to ICT: skills, methodological suggestions for addressing specific curricular content or achievement of curriculum standards in various disciplines)
- objectives of educational policies
- changes in didactic process
- changes at teachers level [9]
- socio-economic impact
- improvements at administrative level
- effects on institutional and organizational climate
- satisfaction of beneficiaries

Thus, by calling methods of different type, transversal or longitudinal, experimental or observational, statistical-extensive or casuistic-intensive, equally for each of the dimensions listed above there can be used tools such as survey, opinion questionnaire, interview, focus group, observation, analysis of documents etc.

UNESCO Institute for Statistics has recently published a guide for measuring the level of implementation of ICT in education, mainly aimed at assessing possible cross-border programs, being focused on procedures and techniques for obtaining data from official administrative sources - thus ensuring on the one hand that the assessments have the necessary financial resources, and secondly that the information is current and reliable. The UNESCO guide develops specific ways of data collection and a indicator calculation methodology based on previous experience of elearning programs evaluation, as well as on conceptual elements from program evaluation theory.

The argument for developing such a general tool as a benchmarking instrument for international and national evaluation is developed by authors based on the important place of ICT in the assembly of education process and system components, benefiting from significant financial investments from governments, and therefore on the need to monitor the growing number of initiatives implementing new technologies in education. On the other hand, the authors noted that despite the history of over twenty years of use of ICT in education, yet there is insufficient reliable and valid data nor minimum standardised guidelines for the establishment of relevant and comparable indicators to

contribute to design and development of new programs and of new evaluations able to support or legitimize decisions and education policies.

Agreeing with the UNESCO guide authors, we can not however ignore the variety and richness of information about interventions, initiatives, projects and programs that, although scattered and epistemologically discontinuous, are indirectly a guide for evaluation practitioners.

References

[1]   *** e-Europe. An Information Society For All – Communication on a Commision Initiative for Special European Council of Lisbon, 2000.
[2]   Balanskat, Anja, Blamire, Roger and Kefala, Stella. The ICT Impact Report: A Review of Studies of ICT Impact on Schools in Europe. European Schoolnet, December 2006.
[3]   BECTA. Harnessing Technology Review 2008: The role of technology and its impact on education. London: BECTA. 2008.
[4]   Botnariuc, Petre & Silvia Fat (2011) Developing the ICT Skills of Guidance and Counselling Practitioners in Romania. Analysis of the National Context. In: Roceanu, I. (Ed.) The 7th International Scientific Conference eLearning and Software for Education. Bucharest: Editura Universitara.
[5]   Chinien, Chris. The Use of ICTs in Technical and Vocational Education and Training. Moscow: UNESCO Institute for Information Technologies in Education, 2003. (Online: http://unesdoc.unesco.org/images/0013/001330/133024eo.pdf)
[6]   Commission of the European Communities. European benchmarks in education and training: follow-up to the Lisbon European Council. Brussels, 2002.
[7]   European Commission, Directorate-General for Education and Culture. Basic Indicators on the Incorporation of ICT into European Education Systems. Facts and figures. 2000/01 Annual Report.
[8]   Istrate, O. Efecte şi rezultate ale utilizării TIC în educaţie. În: Tehnologii moderne de educaţie şi cercetare. Lucrările Conferinţei Naţionale de Învăţământ Virtual. Bucureşti: Editura Universităţii din Bucureşti, 2010.
[9]   Istrate, O.; Velea, Simona (2011) Professionalism in the Education System Today. In: Vlada, Marin (ed.) ICVL. Proceedings of the 6th International Conference on Virtual Learning. Bucharest: University of Bucharest Publishing House.
[10]   Kozma, Robert B. National Policies that Connect ICT-based Education Reform to Economic and Social Development. Human Technology, SRI International, University of Jyväskylä, 2005. (Online: http://www.humantechnology.jyu.fi/articles/volume1/2005/kozma.pdf)
[11]   Organization for Economic Co-operation and Development. Education Today: The OECD Perspective. OECD, 2009.
[12]   Potolea, D. & E. Noveanu (coord.) Simona Velea, Petre Botnariuc, Cornelia Novak, Olimpius Istrate. Informatizarea sistemului de învăţământ: Programul S.E.I. Raport de cercetare evaluativă. Bucureşti: Universitatea din Bucureşti, Facultatea de Psihologie şi Ştiinţele Educaţiei, 2008.
[13]   Toma, Steliana et alii (2009) Teaching in the Knowledge Society: The Impact of the Intel Teach Program in Romania. Bucharest: Agata Publishing House, 2009.
[14]   Trucano, Michael. Knowledge Maps: ICT in Education. Washington: Infodev, 2005. (Online: http://www.infodev.org/en/Document.8.pdf)
[15]   UNESCO Institute for Statistics. Guide to Measuring Information and Communication Technologies (ICT) in Education. Technical Paper No. 2. Montreal, 2009.
[16]   Velea, Simona (2009) Noile tehnologii în educaţie – între slogan şi impact autentic în activitatea de predare-învăţare. In: Tehnologii moderne în educaţie şi cercetare, CNIV 2009, Editura Universităţii din Bucureşti.
[17]   Velea, Simona (2011) ICT in education: responsible use or a fashionable practice. The impact of eTwinning action on the education process. In: Vlada, Marin (ed.) ICVL. Proceedings of the 6th International Conference on Virtual Learning. Bucharest: University of Bucharest Publishing House.
[18]   Vlada, Marin (2009) Utilizarea Tehnologiilor eLearning: cele mai importante 10 initiative si proiecte din Romania (Using eLearning Technologies: the Most Important 10 Initiatives and Projects in Romania). In: Elearning.Romania. Bucharest: TEHNE- Centre for Innovation in Education. Available online: http://www.elearning.ro.
[19]   World Bank/ International Bank for Reconstruction and Development. Monitoring and Evaluation of ICT in Education Projects. A Handbook for Developing Countries. Tunis: InfoDev/ IBRD/ World Bank, 2005. (Online: http://www.unescobkk.org/ education/ict/online-resources)