

Development of general and specific teaching competencies through the educational use of ICT

C. Glava and A. Glava

Babes-Bolyai University, Faculty of Psychology and Sciences of Education, Sindicatelor 7, 400029, Cluj-Napoca, Romania

The present paper organizes around the concept of didactic competence analyzed from the perspective of educational implementation of the new ICT tools. It presents the results of a large research regarding the development of certain general and specific didactic competencies, having as a support the virtual environment offered by the new technologies. Thus, the implications of the educational use of ICT on the profile of the didactic competencies of teachers have been explored. Our intention was that of testing a theoretical model for the development of the educational design and management competencies through the use of specific practical models of learning situations didactic design as well as of learning and classroom management. The practical models chosen are genuine through their innovative educational elements. Based on educational use of ICT these models illustrate some of the most important contemporary tendencies and findings in the field of teaching and learning theory and practice.

Keywords didactic competence, new technology, e-learning, teacher training

1. Didactic competence – the actuality of the subject

The concept of didactic competence represents a new challenge for the Romania research and pedagogical reflection, considering the necessity for teachers' professional profile restructuring in the new context created by the Romania's admission in EU.

The didactic competence is still a concept to be defined between the epistemological perspective (that integrates the scientific approach of the educational phenomenon, the training of teachers being a form of professionalization as any other), and the artistic perspective (the didactic competence is rather considered as a native talent, that is hardly the object for professional training). Without excluding the native inclination for teaching, it is obvious that within the actual challenges put in front of education, the empirical approach to educational phenomena should be replaced by professional competent approaches (Ph., Perrenoud, 2000*).

The need for a pertinent theoretical and experimental analysis of the educational competence becomes even more urgent within the genuine educational context created by the new challenge of effective educational use of ICT.

The new technologies tend to overcome the classical status of simple educational instruments as through their developments they create a motivating context for training of specific educational competences as those of involved in educational design and management of classroom and learning as well as the interpersonal and pedagogical reflection competences.

Thus, the present paper proposes a comprehensive analysis of the so called teacher's professional profile, a concept considered in our study as both a dynamic and complex structure. Use of didactic models represents in our study a methodological context for the application of the new technologies in teachers' training.

Generally, the concept of competence is defined as an integrative set of knowledge, abilities, attitudes and the capacity to apply and transfer them that create the premises of successful accomplishment of certain complex activities or tasks and of effective functioning within a given context or role.

Often used in the field of educational reforms, the term was primarily used in educational settings in relation to teachers' professional development in the United States since the 60's and 70's and consequently largely used in numerous European countries. Initially defined as the a set of learning acquisitions that insure teachers effective functionality in educational settings, the notion of competence continually evolved under the pressure of the new contemporary educational challenges, yet preserving all the common features of professional competence defined above.

The most relevant characteristics that illustrate this conceptual development are, in our view its complexity and the dynamism. While the complex structure of the professional competence profile of teachers is obvious and given by its diverse components, the dynamic value of it is assured by its content where all the operational, instrumental learning products structure around a set of cognitive, affective, and attitudinal acquisitions that are object of on-going reconsiderations and developments generated through the permanent integration of new practical and reflexive pedagogical experiences emerging on the way.

Being interested in a deep understanding on the manner in which the educational competence profile structures as well as on its internal functionality, we developed a graphical model illustrated in following the figure, the benchmarks offered by it serving us as an application setting for our own experimental approach on didactic competence.

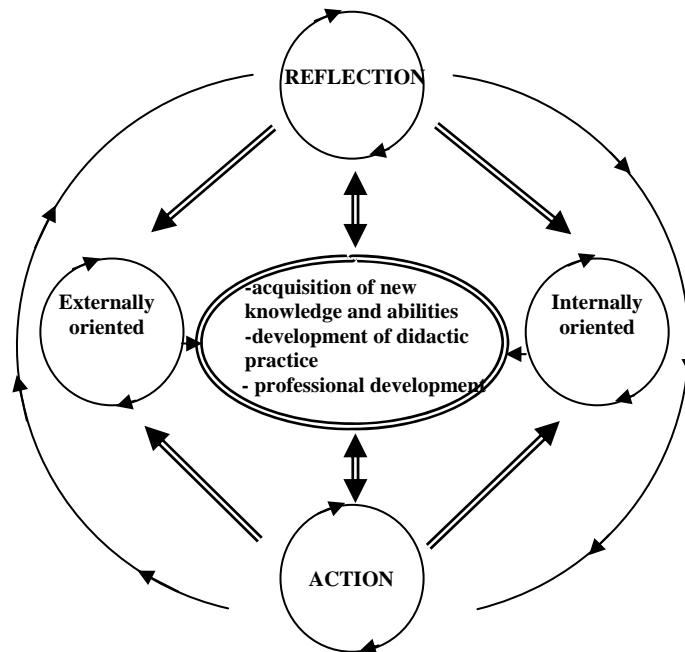


Figure 1. Graphical model of professional didactic competence development

The model is organized around two core attributes of the teaching profession: action and reflection. Both have as objects components of the external context where the professional practice occurs as well as components of the internal, personal setting.

Externally oriented, reflection is focused on aspects such as: effectiveness of ones own didactic actions, the features of the context where profession is practiced, the specific and development needs of the educational program beneficiaries, professional standards and their explicit and implicit determinations.

On the other hand, object of teachers reflections are also the personal, internal characteristics and motivations that support own didactic actions: values, attitudes, manner and level of external requirements and imperatives understanding, level of professional and personal development and future development objectives.

The following table shows the distribution of the resulting didactic competence fields:

GENERAL DIDACTIC COMPETENCES	Action centered	Reflection centered	
Externally oriented	1. Instructional design competences 2. Interpersonal competences 3. Learning and classroom management competences	5. Pedagogical and didactical reflection competences	
Internally oriented	4. Career management competences	I II III IV	6. Professional and personal development reflection competences

Table 1. Didactic competences fields and respective specific competences

The didactic competence profile we developed integrates six general fields of competence, some present under different denominations in other national and international didactic competence models, recognize as a core action and reflection oriented towards the optimization of teacher didactic activity. Being in a permanent interdependence and reciprocal influence, the 6 competence fields structure the unitary profile of professional competence of teachers.

2. Models of didactic competences development through ICT

The experimental approach we proposed has as a premises our understanding that the development of teacher's didactic competence must not resume at the transformation of the didactic practices as it also involves the challenging for restructuring the believes and attitudes that drive the practices. Consequently, we decided to organize the intervention program for the development of teachers' competences on two integrated dimensions: the one aiming at changing teachers' believes regarding teaching and learning, and the one aiming at development of specific didactic competences of instructional design and management of learning and classroom management. The experimental framework used integrates training situations of instructional design with training situations on classroom and learning management, this integrated approach proving its efficiency for both training specific competences and changing the educational believes that drive the practice.

The selected training models were the instructional design model - WebQuest - and the model of classroom and learning management-BSCW (W., Appelt, P., Mambrey, 1999**). The common aspect of the two models is their focus on the use of ICT, a fact that guided our decision in choosing them. The premises we acted on was that facing the teachers with a complex challenge as the one of educational use of ICT has the potential to motivate them for the reconsideration of their educational believes regarding the specific of designing learning situation and management of learning and classroom, one hand and of their own educational practices on the other hand.

Moreover, the actual experimentation of an integrated use of the two models: educational design model WebQuest and virtual learning environment management model BSCW demonstrated its impact that the development of each specific competence has on the others, illustrating the integrate image of the educational competence profile.

Data resulting from the statistic analysis as well as from qualitative processing of teachers learning activities and products prove the fact that the training on using both above mentioned models significantly contributed for the development of teachers abilities of effective learning situations design and management as well as to the improvement of their capacities of using ICT effectively in educational settings.

3. Method

The present study was based on the following research hypothesis: *The use of a didactic design model that integrates the Internet as an educational resource and of a virtual classroom organization*

and management model contribute to the development of ICT educational use didactic competences and create a favorable context for the significant development of educational design and learning and classroom management specific competences of teachers.

The investigation had as a starting point the observation of the integrated nature of the didactic competence profile. Consequently we opted for didactic modeling as a methodological context for competences optimization and development, considering that through their complex and integrated structure, models are able to offer multiple possibilities for new representations of classical concepts and practices related with the aimed competences. We also opted for those models which we considered to have the potential to be transferred, integrally or on their component parts on new classroom activities and in the same time to generally inspire and internally motivate for the optimization of teachers' practice.

The research involved 115 teachers and future teacher undergraduate student. The first research action we undertook was questioning subjects believes and cognitions regarding the educational design and learning and classroom management, aiming as controlling the initial state of their prerequisites and related competences in the mentioned pedagogical fields. Consequently, in the training stage of the experiment we involved subjects in a complex training program that proposed them use the WebQuest educational design model (B., Dodge, 1997***) through the use of BSCW (*OrbiTeam Software GmbH*) cooperative learning platform. The training program included a set of learning units strictly correlated with the specific educational competences aimed to be developed, structured around 20 information sequences, 24 highly applicative activities, 17 explanatory sequences regarding specific design learning and management actions, 16 further information coordinates that support the successful development of applications and three dialog situations developed in the virtual space. We developed the research as local tutors and coordinators within the European Socrates / Comenius 2.1. Project "Think, Construct and Communicate – ICT as a virtual learning environment" ended in 2005 and developed with the financial support of European Commission.

4. Results

The involvement of subjects in the development of the design activities involved in the creation of a WebQuest project, together with the continuing certification of their design decisions and options through sharing them with colleagues in the virtual learning space and integrating their feedback proved the efficiency of the WebQuest didactic model exercised in the virtual space of BSCW for the training of educational design competences.

The qualitative and quantitative analysis of the WebQuest projects created by the subjects unequivocally demonstrate that the use of this specific complex educational design model determined not only the restructuring of educational design competences but also the pedagogical believes regarding the effective teaching and learning. A firm conclusion of our study is that the practices of learning situations educational design are supported by pertinent cognitions regarding teaching and learning.

Integrating multiple communication, cooperation and learning space organization options, BSCW platform represents in fact a "virtual classroom" that used by the subjects of the present research offered fruitful opportunities for training of own learning and cooperation management competences as well as for the successful transfer of the principles of learning management into the learning situations educational design activities.

The high scores obtained for the evaluation of activities subjects developed in the BSCW platform positively correlate (Pearson Bivariate Correlation) with the high scores obtained in the WebQuest educational design activities proved the transferability of management of own learning competences within the applicative context of learning situations design and management that involve school students. The value of Pearson bivariate correlation obtained in our analysis (SPSS Version 13.0) was (+) 0,532, which demonstrates a positive correlation between the two variables.

The results of the present research structure on three categories:

1. *Use of WebQuest models of Internet based didactic activities design leads to the effective development of a set of educational design specific competences, research conclusion supported by the didac-*

tic quality of the design products developed by participants as well as through their pertinent cognitions regarding the didactic design.

2. The use of the virtual classroom model offered by the cooperative learning platform BSCW determines the development of cooperation, team work, control and monitoring of learning and classroom activity, conclusion supported by the quality and frequency of platform activities.

3. The use of both educational techniques (WebQuest and BSCW) leads to the significant development of teachers' and future teachers' competences regarding the effective use of information and communication technologies in educational settings.

5. Conclusions

Modeling of specific didactic competences regarding the design of relevant educational situations as well as the management of learning and classroom on one hand, and the technical competences of educational use of ICT tools on the other hand proves effective in the integrated context of the use of educational models that, through their complexity and constitutive innovation elements determine the questioning of both educational practice and beliefs and motivate for allocation of effort for their improvement.

Our conclusions lead us to certain aspect that may be considered for initial and continuing education of teachers programs' optimization, within the present urge for training them in the classroom use of the now ICT tools:

- Development of ICT use competences must not resume to the training of technical abilities involved, this proving efficient only in the case it correlates with the development of specific educational design and competences involved in the creation of relevant learning situations that involve the use of ICT as well as of classroom and learning management competences.
- Efficient teacher training programs are focused on actual exercising of particular educational practices, the informative aspects being integrated with the formative ones, focused on abilities training.
- Teachers' actual experimentation of the formative aspects of educational use of ICT represents a key action for building their positive attitude towards the new technologies and their educational use. The professional development that implies the use of electronic environments offers teachers the occasion to explore the potential that the educational use of ICT has for general optimization of teaching and learning activities.

References

- [*] Ph., Perrenoud, Construire des compétences dès l'école, Ed. ESF, Issy-les-Moulineaux (2000),
- [**] W., Appelt, P., Mambrey, Experiences with the BSCW Shared Workspace System as the Backbone of a Virtual Learning Environment for Students, *in*: Collis, B., Oliver, R., Proceedings of Ed-Media'99, World Conference on Educational Multimedia, Hypermedia & Communication, June 19-24 Seattle,
- [***] B., Dodge, Some Thoughts About WebQuests, http://webquest.sdsu.edu/about_webquests.html, (1997). (1999).