
THE MENTORED INNOVATION MODEL IN E-LEARNING COURSES FOR TEACHER EDUCATION

Andrea Kárpáti, Eötvös Loránd University, Helga Dörner, Central European University, Hungary

EDEN 2008 Annual Conference, Lisbon, 11-14 June 2008,
Session: Teacher Training for Electronic Distance Education

http://www.eden-online.org/papers/publications/proceedings/Lisbon_08/papers/C3/249.html

Online mentoring or facilitation can significantly raise the quality of professional motivation (**epistemic agency**) of teacher trainees. A successful collaboration with the facilitator in a distance education course models collaborative work place behaviour and teaching at the same time. It can greatly promote the process of becoming a reflective practitioner who is able to work in a team and identify new professional challenges and realise innovative teaching programs is in the focus of modernisation of teacher education in Hungary. In the EU-funded KP-Lab – Knowledge Practice Laboratories Project (www.kp-lab.org), information and communication technology (ICT) tools are employed to catalyze paradigm change from individual to collective knowledge creation practices. In order to create a shared understanding of current knowledge practices and to envision the integrative design and evaluation of novel technological tools and pedagogical methods, a *co-design approach* is employed in different pedagogical scenarios at the Eötvös University of Budapest (ELTE).

Scardamalia (2000) presumes that *developing epistemic agency* involves a knowledge-building process in which agents work independently and jointly "to evaluate and advance their own understandings and communal knowledge" (Cher and van Aalst, 2001). The agents of the communities were both novices and experts – when creating the communities we relied on Scardamalia's (2002) interpretation according to which epistemic agency is a potential means by which "expertise" is construed as part of the knowledge-building principles. According to her the following socio-cognitive dynamics of epistemic agency describe these principles: negotiating a fit between ideas, using contrasts to sustain knowledge advancement, dealing with motivation, evaluation and long-term planning which are normally the tasks of teachers. Knowledge-building discourse is a crucial element of this process which results in refining and transforming ideas and knowledge "through the discursive practices of the community – practices that have the advancement of knowledge as their explicit goal" (Scardamalia, 2002, p.12). At ELTE, the *mentored innovation model*, in which scaffolding the knowledge creation of teachers by peers or e-moderators or facilitators in an e-learning environment to support innovative practices, is employed. Mentoring events in blended learning courses (face to face meetings and online sessions) are organised so as to initiate novices to a professional culture and create or share artefacts through interactions with peers and experts. This model involves role modelling: the roles of the practicing teacher (teacher trainer), educational researcher and the educational policy maker are modelled for in-service and pre-service teachers, who follow the process of making curricular decisions, planning for authentic teaching and learning processes, collecting, creating or adapting digital and traditional teaching aids.

The, **professional mentoring scaffolded by online facilitators and teacher trainers** is an important part of teacher education in the form of collaborative knowledge-building discourse (Scardamalia and Bereiter, 1994) within the working groups facilitated by the e-moderators). In the studies reported here, online and face-to-face discussions and negotiation regarding the design of teaching and learning activities aim at developing the epistemic agency of in-service and pre-service teachers through their involvement in professional processes of knowledge creation. In a blended learning environment, where virtual and real learning spaces are organised to create a synergy of experiences, trialogicality refers to "how shared objects of activity that are collaboratively formulated and developed by using mediating tools, signs, and (conceptual and material) artefacts" (Paavola and Hakkarainen, 2004, p. 4.). In this context, technology provides for *flexible tool mediation* so as to facilitate knowledge-creation processes. However, even if the approach underlines the importance of collaborative activities it also emphasises the importance of the activity of individuals as part of the collective. Thus, *interaction between personal and social levels, the elicitation of individual and collective agencies, the evolving of epistemic agencies* (Scardamalia, 2002) are the main objectives of these studies.

These activities and the trialogic framework itself, imply long-term processes of advancement, thus, instead of focusing on "collaborative moments" in creative collaboration, elaboration of the "developmental history of its formation" (Lipponen et al, 2004, p. 12) is necessary. Both **professional debates and knowledge-building discussions** – when carefully monitored and analysed – can provide authentic "collaborative moments" in teacher education. Teachers' insights regarding the classroom discussions are described by Larson (2000) as: "(1) discussion as a method of instruction, where the purpose is to help engage students in a lesson by "sparking a reaction," "making analogies," "bringing alternative ideas to the topic," or "making them think a little bit more instead of just regurgitating information," whatever the subject matter of the lesson might be; and (2) discussion competence as the subject matter – as the desired outcome of instruction and an end in itself". VanDeWeghe (2005) proves that discussion plays a critical role in students' literacy development. Burchfield and Sappington (1999) argue that discussion in the classroom is important enough that it should be portrayed to students as a critical element in success. Numerous studies indicate that the task of teachers (in the pedagogical scenarios at ELTE facilitators) in guiding and facilitating these discussions is to achieve certain learning or communicative goals. In this context classroom discussions are perceived as a means for students (in the present pedagogical scenarios also trainees and in-service teachers as course participants) to express their ideas and thoughts and negotiate meaning among themselves and between them and the teacher or the facilitator. (e.g Voigt, 1994; Cobb & Bauersfeld, 1995; Mercer, 1997, Yackel, E. 2002; Cazden 1973, 1988; B. Schwarz et al 2006).

Innovative ICT tools that do not only provide platforms for the organization of argumentative processes but also facilitate detailed documentation and analysis communicative events such as debates, discourse can enhance the effects of professional mentoring by trainers. The discourse analysis of a project in teacher education in Hungary shows how these tools improve the quality of training.

The ELTE case: pedagogical scenarios harmonised with the trialogical learning theory

At ELTE, in the *mentored innovation model* (scaffolding the knowledge creation of teachers by peers and facilitators in an e-learning environment to support innovative practices) which is employed for mediating good practice: the concept of trialogical learning served as the theoretical foundation of the *co-design approach* of two pedagogical settings: the *teacher training course for pre-service teachers of English as a Foreign Language (EFL)* and the *domain-specific communities of in-service teachers*.

Development of epistemic agency was carried out within the framework of the implementation and evaluation of international learning resources in collaboration with their colleagues, pupils and facilitators in the framework of introducing the European Learning Resources Exchange (LRE, cf. www.calibrate.eun.org). This repository contains *learning objects* (LO-s, simple elements to be used flexibly in different cultural contexts) and *learning assets* (complex learning materials that are curriculum-related and may contain cultural characteristics to be adapted or accepted.). *The community of in-service teachers* searched and evaluated this repository and identified LO-s and assets useful for teaching practice. By collaborating in small domain-specific groups, creating knowledge-building communities, group members *developed agency* while working on *shared objects* i.e. learning resources in a technology-supported environment. *The group of pre-service teachers* collaborated in problem-solving scenarios in which the object-related activities involved authentic English language usage and simulated teaching practices of English as a Foreign Language (EFL) supported by ICT.

Online collaborations were organised in small groups around knowledge and/or course artefacts such as digital learning materials and lesson plans so that growth of the intellectual, social and emotional inventory used in complex problem-solving activities in which participants' epistemic agencies are being evolved. In the case of the in-service teachers, the design work and the implementation of learning resources required highly reflective behaviour related to their traditional pedagogical practices and provide constructive feedback and be engaged in the long-term co-development of learning resources. As for the pre-service teachers, their "private" ICT use had to be enriched by pedagogical practices related to ICT use in education. The blended set-up (including face-to-face meetings and online sessions) in both scenarios was supposed to provide for the *reflective discussions* by using communication tools in the computer-supported environment. Discussions in the group of the in-service teachers included the possible know-how of implementing the different learning resources, the evaluation of the tested objects and permanent facilitation provided by the *e-moderators* (mentors who supported their work with the LRE through online discourse.) In the pre-service teachers' community processing and negotiating about the usage of ICT in EFL settings – mostly in argumentative form – were aimed at, however, any initiative for broadening the discussion topics was welcome.

Research Hypothesis, Focus and Method

According to our hypothesis, the creative collaboration of groups of in-service and pre-service teachers, a teacher trainer and the pedagogical researchers fosters crossing boundaries between representatives of the Hungarian higher educational scene at different levels. The present pedagogical scenarios allow for both the integration of technological tools within teacher training and the development of teachers' epistemic agency i.e. allowing them to author themselves and their knowledge practices and to take responsibility for their own knowledge advancement (Scardamalia, 2002).

We assume that in mentored innovation model developed at ELTE and used in various e-learning settings, (Kárpáti, 2003, 2004) online communication – knowledge-building discourse facilitated by the e-moderators connected to creative collaborative activities – results in evolving epistemic agency that is characterised by experience-based social participation. Thus, an **explanatory model that defines the position of online communication** in the mentoring processes can contribute to the analysis of the complex process of developing epistemic agency.

By applying the *Participant Satisfaction and Communication Questionnaire* (Dorner, 2007), a quantitative research tool besides semi-structured interviews and qualitative content analysis scheme we intended to employ triangulation in our methodology so that more than one approach is used in the investigation of the research focus (Bryman, 2004). Based on the idea that *agency* represents growth of an individual's (or a group's) intellectual, social and affective inventory of acting in problem-solving situations and overcoming difficulties in social networks, relying on the individuals' reflections on their own sense of advancement is reasonable. In the mentored innovation model in which developing participants' (pre- and in-service teachers') epistemic agency was encouraged, data on their perceived development and satisfaction with the model (and the course) should be a relevant source of data provision, and an indicator of agency.

Participants included 20 pre-service EFL teachers (participating ELT methodology classes at ELTE), and a domain-specific community of 17 in-service teachers of Science, Mathematics, Humanities and Foreign Languages, a teacher trainer and two educational researchers. Pedagogical scenarios were hosted in a Moodle environment and FLE3 (a software designed to support collaborative work that focuses on creating knowledge artefacts) was used for sharing knowledge practices, adapted or self-developed tools. Previous to the questionnaire development process a survey of the literature on the evaluation of online mentoring models and participant satisfaction was carried out (Harasim, 1987, 1993; Hiltz, 1986; Picciano, 2002; Richardson and Swan, 2003, Garrison and Anderson, 2003, Swan and Shih, 2005; Garrison, 2007). Those items were adapted that were considered to be relevant in the presented pedagogical scenarios as regards the experiential information about the respondents in obtaining their rankings of their satisfaction with the facilitators' performance, their perceptions of the facilitators' and their group-members' social presence and their perceptions of the interactions around shared objects (which all have relevance for the socio-cognitive dynamics of epistemic agency (Scardamalia, 2002).

Based on the survey on the relevant literature the questionnaire concentrated on the following constituents of the mentoring model: participants' global satisfaction, the facilitators' role, online communication around shared objects and the participants' perceived social presence. Respondents were asked to consider their ratings in the context of the online mentoring model and rate their agreement (on a 4-point Likert scale) with statements concerning the above-mentioned variables.

Results and Discussion

Satisfaction regarding the mentored innovation model was explored by relying on the perceived (subjective) values provided by the participating respondents. The questionnaire surveyed satisfaction by rating the participants' satisfaction with the above named four constituents of the mentoring model. However, sub-components of these constituents do not influence participant satisfaction to the same extent. Thus, instead of employing statistical means and relying on normal distributions for further analyses, we used multi-regression data analysis so as to depict the perceived importance of the constituents and their sub-components that have an assumed impact on course satisfaction (*an indicator of agency*). During the analyses both dependent variables that quantify the respondents' perception of the constituents of the mentoring model and independent variables were created. In the first phase of the regression analysis we focused on investigating the extent to which the independent variables affect the dependent variable.

The following procedure was carried out in the case of all the four constituents of the model. The 4-scale ratings were converted to a 0-100 scale in order to yield single scores for each variable. Regression analyses were computed and significant items were indicated – with the respective importance values. On the basis of the importance values global indexes were calculated referring to the four constituents. In the second phase of regression analyses we employed these indexes.

We found four variables to have significant impact on the *participants' global satisfaction*: benefits (affective rather than cognitive nature) (imp. 0,30), the *experience gained by participating the mentored innovation model* (imp. 0,22) and *self-perceived knowledge advancement* (imp. 0,19) (residual 29%). Regarding the evaluation of the *facilitators' role* two variables showed significant impact: *feedback provided by the facilitator contributed to the self-perceived knowledge advancement* (imp. 0,25) and the help offered by the facilitator (imp. 0,40) (Residual: 35%). In respect to the perceived *social presence* two variables proved to be significant: *participants' point of view was acknowledged by the facilitator* (imp. 0,16) and *distinct impressions of the group members were created* (imp. 0,09) – the residual percentage in the case of the social presence is high 75%. Thus, further elaboration is needed. Opposed to the social presence the residual part in the case of the *online communication constituent* of the mentored innovation model showed a relatively low value (22%), the following three variables proved to have significant effect on the participants' satisfaction with the online communication around shared objects: *feeling comfortable with participating the online knowledge building discussions* (imp.0,34), *individual opinions acknowledged by group members* (imp. 0,27) and *feeling comfortable conversing with the facilitator through the online surface* (imp. 0,17).

Table 1: Results regarding the components of the mentored innovation model

	Standardized Coefficients		df	F	Sig.	Importance	Importance
	Beta	Std. Error	Beta	Std. Error		After Transformation	
Experience gained by participating	0,3256	0,12	2	7,8	0,00168	0,3039	22%
Benefits (affective)	0,4272	0,12	3	12,9	0,00001	0,4302	30%
Self-perceived knowledge advancement	0,3494	0,09	2	14,8	0,00003	0,2659	19%
Help provided by the facilitator	0,5337	0,13	2,0000	16,61	0,00001	0,6173	40%
Feedback from the facilitator	0,3554	0,13	2,0000	7,36	0,00203	0,3828	25%
Distinct impressions fo the members	0,3547	0,14	3	6,72	0,00106	0,3548	9%
Point-of-view acknowledged by the facilitator	0,4754	0,14	2	12,07	0,00010	0,6453	16%
Participating the online knowledge building discourse	0,4885	0,09	3	32,94	0,00000	0,4408	34%
Individual opinions acknowledged by the peers	0,4767	0,08	1	37,87	0,00000	0,3458	27%
Online surface as mediating tool	0,3277	0,08	2	15,68	0,00002	0,2135	17%

Setting up the explanatory model that defines the position of online communication (knowledge-building discourse) in relation to the participants' satisfaction was carried out in the second phase of the regression analyses. In the first circle of analyses we investigated the constituents impact on the participants' global satisfaction. We found that online communication has a direct and significant impact on the participants' global satisfaction ($p < 0,00000$; $imp. 0,505$). The satisfaction with the facilitator's performance ($p < 0,00006$; $imp. 0,105$) and the perceived social presence of the participants ($p < 0,04556$; $imp. 0,117$) have an indirect impact on the online communication in the mentoring model; an indirect impact between the latter two elements was also depicted, however, the cause-effect relationship was difficult to establish. Thus, we can only assume that the successful mentoring of the facilitator influenced favourably the participants' perceived social presence of the facilitator and their peers.

Perceived cognitive, social and affective growth as indicators of developing agency in the ELTE mentored innovation model

In the presented mentored innovation model the *online communication around shared objects* constituent had a direct and significant impact on the participant's overall satisfaction. Statistical analysis supported the assumption that interacting with peers and the facilitator in creative collaboration, which aims at developing epistemic agency, plays a crucial role. The mentoring model was designed so that facilitators in their position as *online instructors* can act more like *consultants* and *resource providers* (Berge, 1995; Hootstein, 2002) rather than the exclusive source of knowledge and evaluator as in a more traditional pedagogical setting. According to our hypothesis developing and utilising this mentoring method and "instructor attitude" allow for a more creative collaboration and collaborative knowledge building through interaction around shared objects within the micro communities and reduce the rigid forms (one-directional flow) of knowledge creation that centres on the instructor. With regard to the need to provide for and maintain knowledge-building discourse our hypothesis was supported since respondents felt comfortable with participating the online knowledge building discussions, they felt that the individual opinions were acknowledged by the group members and the mediation through the online surface was also effective. Interestingly, however, the participants' satisfaction with the self-perceived knowledge advancement appeared to be less prevailing than expected on the basis of the shared objects co-developed by the groups (in the case of the pre-service teachers course artefacts regarding ICT in EFL teaching; in the case of the in-service teachers high-quality learning resources).

Participants rated the sub-components relating to the self-perceived knowledge advancement – self-perceived knowledge advancement as part of the global satisfaction and the feedback provided by the facilitator that contributed to the self-perceived knowledge advancement lower, thus, they were of less significance from their perspective. In our view this is explained by the fact that the mentored innovation model which focused on the collaboration of peers and co-development of epistemic agency through knowledge-building discourse differed to a great extent from the teaching and learning models the participants have experienced so far. Consequently, knowledge gained in these settings under such circumstances is less identifiable and rateable for those who have been socialised according to those intellectual traditions that are based on *individual* knowledge creation processes. Perceptions regarding the social or affective dimension of the mentored innovation model and the co-development of epistemic agency showed a more optimistic and satisfying picture. Participants were highly satisfied with the benefits gained in the process, the help provided by the facilitator and the way she/he accepted their point of view; and on the basis of their perceptions they managed to create distinct impressions of the group members. These results provide support for the hypothesis that the facilitators in the mentored innovation model managed to act as effective "social directors" whose responsibilities include program managing and offering technical assistance as well (Hootstein, 2002).

In this paper, examples of the use of ICT based discussion in teachers' professional development were offered. Teacher trainees and practicing teachers confronted trainers and mentors in virtual learning environments. Moodle and Fle3 were successfully integrated in the training program and were found inspiring and beneficial for motivation among the various stakeholders of the training process. Thus, the relevance of the use of ICT in the realization of triological learning principles was proved already in the first iteration of teacher training cases of the KP-Lab project

References

1. BERGE, Z.L. (1995). *Facilitating Computer Conferencing: Recommendations from the Field*. Educational Technology, 35(1) 22-30.
2. BRYMAN, A. (2004). *Social research methods*. Oxford: Oxford University Press.
3. DORNER, H. (2007). The role of e-mail communication in fostering knowledge creation in a teacher training course designed in a collaborative learning environment. A paper presented at the 12th Biennial Conference for Research on Learning and Instruction (EARLI), Aug 28 – Sept 1, Budapest, Hungary.
4. HARASIM, L. (1993). Collaborating in cyberspace: using computer conferences as a group learning environment. *Interactive Learning Environments*, 3(2), 119-130.
5. HILTZ, S.R. (1986). The „virtual classroom”: using computer-mediated communication for university teaching. *Journal of Communication* (Spring), 95-104.
6. HOOTSTEIN, E. (2002). Wearing Four Pairs of Shoes: The Roles of E-Learning Facilitators. In G. Richards (Ed.), *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2002* (pp. 457-462). Chesapeake, VA: AACE.
7. KÁRPÁTI, A. (2003). *Digital Didactics for Mobile Learning*. In: Kristóf Nyíri, ed., *Mobile Communication: Essays on Cognition and Community*, Vienna: Passagen Verlag, 2003 (45-57)
8. KÁRPÁTI, A. (2004). *Travellers In Cyberspace: ICT In Hungarian Romani (Gypsy) Schools*. In: Kárpáti, Andrea Ed. (2004): *Promoting Equity through ICT in Education*. Paris: OECD, 141-156
9. LIPPONEN, L.; HAKKARAINEN, K.; PAAVOLA, S. (2004). Practices and Orientations of CSCL. In J. Strijbos, P. Kirschner, & R. Martens (Eds.), *What we know about CSCL in higher education* (pp. 31-50). Boston, MA: Kluwer Academic Publishers.
10. PAAVOLA, S.; HAKKARAINEN, K. (2006). Background and Characteristics of „Triological Learning”, v.2.0. Working Paper. University of Helsinki.
11. PICCIANO, A. G. (2002). *Beyond student perceptions: Issues of interaction, presence, and performance in an online course*. *Journal of Asynchronous Learning Networks* 6(1) Retrieved January, 6, 2006 from http://www.sloan-c.org/publications/jaln/v6n1/pdf/v6n1_picciano.pdf
12. RICHARDSON, J. C.; SWAN, K. (2003). *Examining social presence in online courses in relation to students' perceived leaning and satisfaction*. *JALN* 7(1). 68-88.
13. SCARDAMALIA, M.; BEREITER, C. (1994). *Computer support for knowledge building communities*. *The Journal of the Learning Sciences*, 3 (3), 265-283.
14. SCARDAMALIA, M. (2002). *Collective cognitive responsibility*. In: B. Jones (Ed.) *Liberal Education in the Knowledge Age*. Chicago: Open Court.