

## WP1. Defining learning strategies for Colabs – the Hungarian approach

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This report is illustrated by presentation: [Colabs\\_elte.ppt](#)

In our approach for the use of learning strategies for the Colabs project we have to compare the traditionally used (teacher centred) *teaching* and the modern (learner centred) *learning* process that reflects on the deficiencies of the present educational practices in schools in contrast with the innovative model that is encouraged:

- **Teaching** at present is more or less based on the traditional “instructional” teaching model, where the teacher transfers knowledge (that is the image of the knowledge within the teachers) and the learners are to absorb the image as knowledge. In this model knowledge is made equal with its image within the teacher and the learners are mainly passive receivers, where differentiation is quite impossible, the learning process is difficult to track and is not very effective.
- **Learning** concentrates on the learners and how they individually map the image of the knowledge collaboratively through hands on experiences supplementing each other, debugging the developing models, guided by the teacher as coach in the process. In this model knowledge evolves through experience in an active process, where learners are contributors themselves.

*So what is the role of ICT in this process?*

First of all ICT is a complex structure in itself composed mainly of the triple: *Information*, *Communication*, and *Technology*, including common elements as on-line materials, different networks for exchanging information, CD-s and other tools, as well as interactive materials with respect to learning.

- **Adding ICT to the traditional teaching model:** where teachers are not fully aware of the whole complexity of ICT (since schools are not well equipped, teachers are not aware of most innovative possibilities, and ICT develops more rapidly than teachers are able to catch up with) mainly mirror their disjunctive image of the elements of ICT in the process of “*teaching ICT*”. Those of the students, who have contact with ICT in its real structure, turn away from such approach and dive into their own possibilities; those who are not interested in technological approach, shun away and remain untouched by the topic; and those who try to accommodate, might not have the right tools suitable for their ability and personality and thus it is questionable what effect (if any) could this process result. Most of the participants end up by being unhappy within their role.
- **Adding ICT to the active learning model:** the learners are constructors of their own knowledge (every participant contributing their own) through problem solving in a collaborative way (adding up knowledge and compensating for deficiencies), where the teacher provides a compass for “*learning how to learn*” about complex structures. Most of the participants feel their importance in the process and are thus motivated to progress through such collaborations even on a virtual basis.

Thus our approach for development is to **provide activities that would develop the whole complexity of the learner** composed mainly of the triple: *personality, knowledge, and communicative abilities*, including the ability to acquire knowledge, map new knowledge on previous domain, express one-self while doing so, as well as develop creativity through the process. Our model is based on “*activity theory*” by allowing the emerging selection process of the right tool for each object in the learning process in case of each subject entity to be learned. This methodology should result is a successful achievement by converging the triple into one, attacking the single aim. Our aim in the project is to provide a suitable background to able the emergence of the right triples.

The tools used in the process are not to be used as black-boxes, but as open and transparent, Lego-like tools, which allow the understanding of their use and function in the process, thus the ability to modify them for own purposes. Tools are mainly to be used for modelling and self expression, in which the elements of the model can be dissected as deep as needed, re-constructed suiting purposes to allow its use for self expression as wished. Thus the **development of tools is included throughout in a form of progressive courseware**.

Using Logo-like philosophy of **constructivism** (as originating from Piaget and adapted by Papert), “*learning by doing*” instead of just hearing and seeing what should be done, learners explore the topics, exert critics of the problems, develop plan for solutions and debug models till application suits needs, meanwhile they communicate their ideas all through the process. Communication is of great importance in the process, where ideas, theories, messages, knowledge, critics can be exchanged in order to improve the process.

**Learning through a collaborative process** (according to “Zone of proximal development” by Vygotsky) is effective, since all participants possessing stable knowledge chunks are able to compensate and develop the areas of those who lack a missing link in that direction, thus individuals contribute to each other’s development. In this case teacher and students are at the same level of participation.

The activities to be developed in Colabs are **based on our previous experiences** with two types of materials we have developed and used in our projects with success. The instructional design principles underlying the two course materials included both objectivist and constructivist learning design models, following the guides of Jonassen and his colleagues: that the initial knowledge acquisition is better served by instructional techniques, based on traditional instructional design, whereas constructivist learning environments are most effective for advanced knowledge acquisition stage of learning, where theories and instructional design practices are implemented within our teacher/mentor training.

Two massively huge materials have been used in our previous practices:

**NETLogo:** A Logo course material, which includes self-paced activities and subject microworlds that can be used in different subject areas together with their methodologies. Diverse starting points and links allow different paths to be taken by learners. The different units provide guidance on how to handle problems, give tasks and projects to fulfil and submit.

- *The basic aim of the material in case of elementary school children* is to be able to utilise modelling as a tool for investigations through problem solving, building structures, debugging ideas and virtual environments. Work should start out by playing with games and educational microworlds, which should be well understood using the provided course material and could then be modified. The process is based on self-motivation with the intention to learn how to learn at own pace.
- *The basic aim of the material in case of teachers (helpers/mentors)* is to be able to utilise and configure educational microworlds for children's needs, to be able to guide children through modelling practices, and be able to design simple microworlds for multidisciplinary use.

**Creative Communications:** A complex project-based material that integrates subject knowledge and ICT skills to promote creative thinking and expression on an interdisciplinary platform. Project assignments are grouped into themes: *Writing, Narration, Typography, Visual representation, Montage, Motion;* and *Concept maps*. Participants should choose one or at most two themes plus *Concept maps* and should supplement each other's knowledge while producing group-work. Assignments within a theme build on each other touching the use of tools to facilitate authoring, emphasis creativity and self expression, and some require collaboration between the real and the virtual participating communities.

- *The basic aim of the material in case of elementary school children* is to be able to express oneself and communicate using ICT tools as well as be able to collaborate in real and virtual environments. Work should start by experiments with expressions as well as guides for tools to express with. The process is based on self-motivation with the intention to learn how to fulfil deadlines while doing projects.
- *The basic aim of the material in case of teachers (helpers/mentors)* is to be able to explore ICT tools and their application on different tasks, where the emphasis is not on the tool, but the process of creation itself. They should also be able to integrate assignments with on and off-computer activities that enhance the creative process.

Both provide adequate convergent and divergent activities to develop problem solving skills and enhance creativity. **Combining the two approaches we now plan to develop microworlds in Imagine and learning materials for Imagine**, that able activities in both directions. Both materials are aimed at learner and teacher (helper/mentor) in parallel and aim to develop competencies in use of tools for self expression:

- *What* kinds of tools can be used?
- *When* should each tool be used for certain information authoring purposes?
- *How* can certain media elements improve the communicative effects of messages?
- *Why* should we communicate with individuals especially on an international level?

By learning how to develop such microworlds, learners would be armed with the ability to configure and/or develop own tools, which would further increase their competencies, motivation for contribution in collaborative activities, communicate within real and virtual environments, and thus possess the abilities needed for effective participation in an online working community.

The **on-line environment allows the inclusion** of small communities at a distance, and underdeveloped regions, thus facilitating capacity building and inclusion of minorities and those with disabilities as well.

The emerging on-line support on the **CoLabs network starts out from the e-learning model** practiced so far in our tele-house project:

- Teacher trainers at university develop competencies to become potential mentors in order to aid activities.
- Interested and helpful persons can become student mentors by possessing competencies on-line to develop into full mentors.
- Local helpers/teachers are given aid and support on-line to facilitate activities in real communities.
- Learners are provided direct and indirect support during their participation.
- This model is not only developed on a local level, but is also extended on an international level.

## **Justification of achievements and supporting circumstances**

**Evaluation** is realised through several levels by involving external evaluation processes to justify further our methods and results.

- Activities are tracked throughout the process to be able to identify answers to our research questions and acquire the knowledge for further developments to produce an efficient learning community.
- The working method of the CoLabs partnership allows meetings to present our developments to each other and exert critics, guiding partners to better results.
- We shall attend local conferences twice a year, where we present our findings to practicing teachers, involve them in the discussions and motivate them to participate in the networking activities to provide us with further inputs. We provide workshops for newcomers and on-line materials in order to acquire mentoring competencies. We value their critiques and inputs and their reactions on-spot and on-line.
- We shall attend two international workshop (Eurologo in Portugal, and IFIP in Hungary) where we shall try to involve international participants, both students and teachers in our activities, and motivate them to progress online in the network. We value their critiques and inputs and their reactions on-spot and on-line.
- We make contract with a local external evaluator, who is a professional and researcher in public education, and ask her input at each milestone of our activities through written evaluation.

**Dissemination** shall take place through our web site as Colabs web page and portal, exhibitions and workshops at conferences, brochures issued and spread on all possible pedagogical activities, and by publishing scientific papers and giving presentations at educational conferences.

**Commercialisation** of Imagine (which is an essential part of the project activities) is planned to be achieved through the ministry (by asking support for distribution and the purchase of rights) or through the university achieving very low prices and paying royalties after each purchase.