

GENERAL INFORMATION



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INTRODUCTORY NOTES

for Specialised Training Course on ‘Multimedia in Education’

IITE UNESCO has asked Dr *Bent B. Andresen* from the Danish University of Education to coordinate preparation of materials for a specialised training course on ‘Multimedia in Education’.

In particular, Bent B. Andresen has been asked to coordinate the preparation of proposals for an introductory note, curriculum and supplementary set of materials for IITE UNESCO Specialised Training Course. He, then, invited *Katja van den Brink* from the University of Landau in Germany, to be the co-author.

Moreover, Bent B. Andresen was asked to select a group of experts for an international team to develop of the materials for the UNESCO Specialised Training Course ‘Multimedia in Education’. The members of this expert team are:

Christopher Abbott, School of Education, King’s College, United Kingdom

Roger Säljö, Göteborg University, Sweden

Sigmund Lieberg, Oslo University, Norway

Jari Multisilta, Tampere University of Technology, Finland

Peter Reimann, University of Heidelberg, Germany

Antonio M. Duarte, The University of Lisbon, Portugal

1 Target Audience

The Specialised Training Course is developed within the framework of *The IITE Educational Programme on ICTs in Education*.

According to the classification of IITE UNESCO Educational Programme the target audience is:

1. Heads of pre- and in-service teacher training and vocational development institutions, trainers of trainers for ICTs in education, instructional guidance and support specialists;
2. Teachers, ICT school coordinators and other educational personnel.

2 Level of Preliminary Knowledge of Participators

- Teachers’ education;
- ICT literacy (for example, acquired via other courses in the IITE Educational Programme on ICTs in Education);
- Basic knowledge about the function and application of ICT into schools.

3 Aims and Outcomes of Specialised Training Course

The aims of the UNESCO Specialised Training Course ‘Multimedia in Education’ are that the target groups construct deep knowledge and high competencies regarding:

- Why, where and how multimedia can be used in school educational settings;
- Pedagogical scenarios concerning the mainstream and future use of educational multimedia;
- Important learning and teaching aspects, in particular, teachers’ roles, students’ learning strategies, social/collaborative learning, ICT literacy, metacognition, and motivation;
- Present educational goals and how educational multimedia can support these goals;
- Critical and reflective selection and use of educational multimedia according to mainstream scenarios for the use of multimedia in education;
- Evaluation methods related to the educational use of multimedia.

In particular, the objective is development of motivation to use multimedia in education and to adapt the knowledge and skills of the course into the educational practice.

Knowledge means in this sense theoretical and practical knowledge concerning the content to be learnt. Competencies mean the ability to transfer and adapt the skills of the course into a real classroom situation. After this Specialised Training Course, the trainees are expected to be able to use and apply the acquired knowledge and competencies in their school situation.

4 Content of Specialised Training Course

The content of the course regards the use of educational multimedia in education. In particular, the content regards the role of teachers and students and the potential impetus of multimedia on the students’ learning, motivation, cooperation, etc.

Currently, the students are encouraged to use a growing number of multimedia products in a number of different ways. The application of interactive multimedia into educational systems takes place all over the world, although the range and speed of the implementation varies from country to country. In educational settings, the multimedia products and on-line services serve as a means of communication and expressive tool in various pedagogical scenarios.

The notion of *pedagogical scenario* designates a postulated sequence of imagined events of a learning situation. Each of these is characterised by particular roles of teachers, students and educational multimedia products. Some educational products are designed to control the process of presentation, and students are assigned a somewhat passive role as receivers of information. Other educational multimedia products are interactive in the sense that students are assigned an active role where they can select topics and jump between these.

The different ways in which students deal with multimedia are categorised – according to the scenario model – in four pedagogical scenarios (Andresen 1999d):

1. The use of multimedia linear educational sources;
2. The use of multimedia hypertext-based materials;
3. The use of multimedia supervising products;
4. The use of multimedia productive tools and ingredients.

Scenarios No. 1-3 concern the students as *end-users* of messages from educational multimedia, whereas Scenario No. 4 regards the students as *producers* of small-scale multimedia products.

The use of linear multimedia in Scenario No. 1 regards the students' reception of the content of linear multimedia products. These lead the students through different tasks in sequence. They can pick the episodes they want. However, once the potential useful sources have been located, the students have very limited control over the narration.

The use of hypertext-based educational materials in Scenario No. 2 encompasses the students' reception of the content of non-sequential multimedia products. These non-sequential narratives encompass hypertext-based, interactive CD-ROMs and Internet services and they are often used as information providers. No guidance is offered through the different sections leaving the student as an explorer.

The use of multimedia tutoring products in Scenario No. 3 regards the students' reception of the content of multimedia products aimed at teaching. These products display various guides for the students and help them break down and structure different tasks. This type of products typically consists of a kind of tutoring strategy e.g. knowledge about a subject matter and about instruction, often presented in drill-and-practice sessions and a critiquing strategy e.g. provision of feedback tailored to the particular needs of each student helping her/him confirm hypotheses and refine proposals.

The use of multimedia productive tools in Scenario No. 4 covers the students as authors and producers. This scenario regards production of their own multimedia presentations by means of proper multimedia elements to be used by the students to produce multimedia in the classroom and proper

tools to handle these texts, graphics, sounds, etc. The students take on the role of a producer.

The four Scenarios cover widely used multimedia genres in educational settings that differ with respect to the role of the students and the teachers as well as the function of the multimedia products and on-line services. Many mainstream approaches are similar to one of the Scenarios presented or consist of a mixture of these.

It does not mean, however, that the widespread multimedia pedagogical practices are considered limited to these four approaches. The intention is to describe some typical pedagogical scenarios and not to present an exhaustive list of scenarios. More specialised scenarios may, of course, also be found.

The participators taking the course 'Multimedia in Education' are expected to be able to develop knowledge and skills regarding the following topics:

- The scenario model concerning the use of multimedia in education and important learning and teaching aspects while learning with educational multimedia;
- Critical and reflective selection of educational multimedia according to educational objectives of the use of multimedia (what knowledge and competencies do students need to develop and how might educational multimedia support these goals?);
- The applications of educational multimedia according to Scenario 1, 2, 3 and 4 and mixtures of these into schools/educational settings;
- Proper methods of evaluation of the knowledge and competencies acquired.

From the point of view of school organisation, the integration of multimedia in the process of teaching and learning demands reflexive, pragmatic and experiential approaches which place the teachers, ICT school coordinators and other educational personnel at the centre of the innovation. Using multimedia, the teacher's role is extended from the transmitter of information and the primary source of knowledge to being one among other sources of knowledge and a facilitator or a conductor of the learning processes.

5 Brief Descriptions of Instructional Methods

The course can be given in two ways. The form can either be conventional classroom education or e-learning (i.e. open and distance learning via the Internet).

Conventional provision is the most common offering of in-service teacher education. This form requires the participators to travel to the

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Conventional provision is the most common offering of in-service teacher education. This form requires the participators to travel to the

institution for the purpose of in-service education. In most cases, it is characterised with oral presentations by the instructors and dialogue with the participators, tutorials and guidance, and laboratory practice in the computer lab and other labs. Often, it includes periods with study in libraries or media resource centres.

It is recommended to use the characteristic technologies such as an overhead projector and presentation of images from the computer screen. Furthermore, the computer is necessary as a learning and teaching tool to use for constructing knowledge.

E-learning is characterised by the separation of the teacher and the participators. The interpersonal face-to-face communication of the conventional education is replaced by a mode of communication and guidance mediated by the Internet. This form of in-service education is considered a complement to conventional provision in many countries. The evaluations are positive if both forms are connected with each other. Many school leaders, coordinators and teachers prefer to be able to work on their own and in teams of participators in part of the course (Andresen, 2000).

It is planned to provide separate guidelines concerning the conventional provision and the e-learning approach devoted to the instructors of the course 'Multimedia in Education' as well as to the participators (a student guide).

The instructional method of the presented curriculum is based on a common approach for both forms of learning i.e. e-learning and conventional classroom learning. The basic instructional approach is a learner-centred approach – self-regulated and collaborative learning guided and supported by the trainer. The integration of multimedia in the process of teaching and learning demands very reflexive, pragmatic and experiential approaches which place the individual course participator at the centre of the learning process. Placing the course participators in the centre of their learning means that they have to find their own individual access to the information for constructing their knowledge. Therefore, they need a huge pool of appropriate individualised strategies, which enable them to be active and critical learners.

6 Brief Description of Main Phases of Modules

The individual modules/sessions are divided into three phases: construction of declarative knowledge (knowing that), construction of procedural knowledge (knowing how), construction of structural knowledge (knowing why) and reflection on the information, the acquired knowledge and capacities.

The order of these three phases differs. In some cases it makes sense to reflect on the topic. In other cases it is recommended to try a certain multimedia ap-

plication or tool without a big body of knowledge or reflection. Therefore, the modules of the course will be taught differently according to the learning goals and the participators' previous knowledge. The particular didactics recommended will be described in connection with each of the Specialised Training Course modules.

7 Recommendations for Organisation

The course should be held in classes with no more than 20 students at the same time.

Every student should have access to a computer during the course. Since the course also deals with the multimedia materials on the Internet, it is recommended to have Internet access.

A list of recommended equipment can be found in Appendix 2.

There will be times when the students work together in teams of three.

8 Total Time Requirements

50 hours.

In practice, the time needed will depend on the participators' previous experiences with ICT and education.

9 Link Collection

There is a broad link collection (for web address see Appendix 1) on learning and teaching with multimedia. This gives further perspectives and information on how to work with multimedia in the classrooms.

10 Curriculum – Learning Modules

Module 1) Introductory Workshop: The Use of Multimedia in Schools

The overview Introductory Workshop provides the participators with a first insight in the state of the art of the topic 'Multimedia in Education'. The workshop considers teaching and learning with educational multimedia from a teaching and learning perspective as well as from a practical point of view.

Module 2) Course Participants' Evaluation of Their Own Knowledge and Competencies

Module 2 deals with the participators' assessment of their own knowledge and capacities. Positioning the topic assessment/evaluation at the second part of the module is due to didactical reasons: the students will learn from the beginning to reflect on their own activities and knowledge.

The participants are expected to work out a performance assessment (Collins, 1992) in form of a portfolio approach. The production of their own file during the course with the help of multimedia tools can feed several needs of the curriculum – self-evaluation, outside evaluation and the development of various competencies.

Module 3) Multimedia Use According to Scenario 1/2/3 – The Learner as End-User of Multimedia

The application of multimedia in education means many things to many people. However, the use of educational multimedia can be classified according to some mainstream scenarios. As mentioned in the previous section, the Scenario model encompasses four pedagogical scenarios which cover the most common use of multimedia applications (Andersen, 1999).

This module deals with the reception of linear-narrative elements (Scenario 1), of non-sequential elements (Scenario 2) and of elements aimed at teaching (Scenario 3) of educational multimedia.

The concept of the Scenario model will be worked out practically in pairs/group work at the computer.

Module 4) Multimedia Use According to Scenario 4 – The Learner as Producer of Multimedia

Concerning this scenario, the participants are supposed to produce their own multimedia presentation by the means of proper tools to handle texts, graphics, video, sounds, etc.

A multimedia portfolio evaluation will be integrated into the multimedia production.

Module 5) Critical and Reflective Use and Selection of Educational Multimedia

In this module, pedagogical reflections on the use of educational multimedia will be considered as well as the critical selection of multimedia applications.

Module 6) Learning with Educational Multimedia

This module deals with theories on learning. In particular, the learning aspects such as learning conceptions, learning strategies and self-directed learning, metacognition, social/collaborative learning, ICT literacy, and motivation will be deepened and experienced.

11 The Order of Modules and Sessions

It is suggested to start with the workshop. During the workshop the course participants will be introduced to the main topics of the Specialised Training Course.

teaching Module 6 (*Learning with Multimedia*) due to the aspect that Module 6 deals with certain learning theories and learning aspects which are important to understand, and apply Module 4 in a pedagogical way.

12 Overall Teaching Guide

Didactics for All Units

The integration of ICT and multimedia in schools can change the existing learning principles tremendously. The school's organisation may become innovative in the sense that it adopts reflexive, pragmatic and experiential approaches which place the individual student closer to the centre of the learning processes. Using multimedia often means there are more student-centered work and flexible schedules. The teacher's role is often changing from being an authority or the source of knowledge to being a facilitator or a conductor of the learning process. Students have to find their own individual access to the fast changing world and, therefore, they need a huge pool of appropriate individualised strategies, which enable them to be active and critical learners. The ability to share knowledge collaboratively with others in a world where most products are the result of teamwork having the appropriate strategies and knowing why and how to apply them, will be one of the most important qualifications in lifelong learning.

The individual modules/sessions are divided in three phases: construction of the declarative knowledge, (knowing that), construction of the procedural knowledge (knowing how), construction of the structural knowledge (knowing why) and reflection on the given or found information, the acquired knowledge and capacities, whereby the order of these three phases is not important. This means sometimes that it will make sense to reflect first on the topic or to try a certain multimedia application or tool without a big body of knowledge or reflection.

What is learned may not be what the teacher intends to be learned (Candy, 1999; Driver and Oldham, 1986 – cited according to Biggs and Moore, 1993). The major determinants of learning are internal to the learner:

- 1) What is learned depends on what is already known. Most important determinant of learning is existing knowledge; the students construct with the bricks and blueprints they already have. New knowledge obviously affects the outcome, but not as powerfully or directly as we assume.
- 2) Learning is an ongoing process; it is continuous and active. The learner will have relevant experiences prior to and following formal instruction. It is better if formal instruction tries to encourage and make those links explicit rather than ignore them.
- 3) Learners have responsibility for their learning. In line with a constructivist view of learning, one must allow learners to develop self-direction and not to force 'correct' constructions onto them.

Thereafter, it depends on a course trainer how to organise the structure of the course. The order provided in the description of the Specialised Training Course might be suitable in many situations.

The trainers are expected to deal with the order of the sessions according to the individual needs of the course participants.

Since Module 6 regards the rationale behind the use of multimedia in education, it is possible to change the order of the modules and provide it immediately after the introductory workshop.

It is suggested to follow the market metaphor (Figure 1) which means that the trainer can choose the order of the topics according to his or her own needs. The starting point is the workshop. However, after completing the workshop, the trainer might prefer to start with theories on learning or he/she might like to start by selecting the practical parts of the curriculum. The assessment of the course participants is a topic, which could be placed directly after the workshop, if the trainer is interested in the portfolio approach and if he/she wants to integrate the participants into their own assessment.

Moreover, there are many opportunities to structure the content of the curriculum. For instance, teaching Module 4 (Scenario 4) might alter with

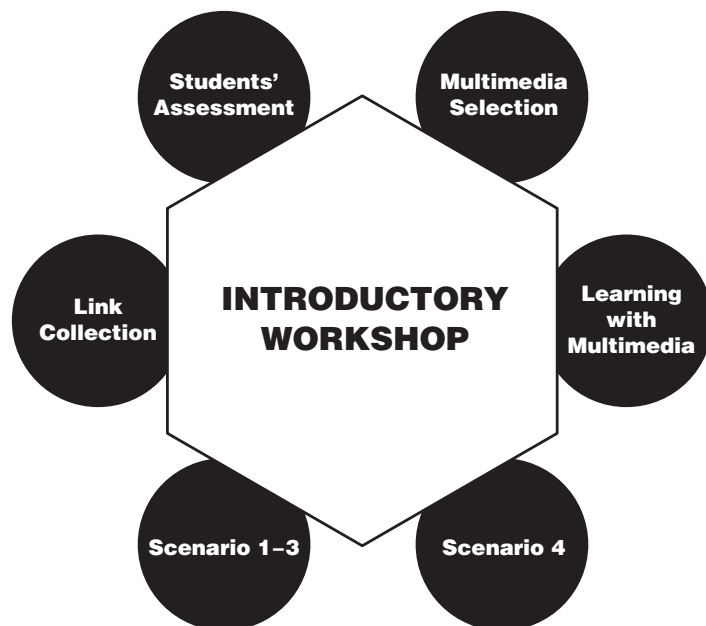


Figure 1. Organisation of the Specialised Training Course ‘Multimedia in Education’