

Interactive Educational Multimedia, number 2 (March 2001), pp. 57–68  
<http://www.ub.es/multimedia/iem>

# *Distance Multimedia Degree Studies. The Application of Multimedia Technology to Multimedia Studies*

---

**Josep M<sup>a</sup> Monguet, Joaquin Fernandez**

*Grup d'Investigació Multimèdia del Departament d'Expressió Gràfica a l'Enginyeria.  
Universitat Politècnica de Catalunya.*

**Juan José Fábregas, Miquel Moron**

*Escola Multimèdia de la UPC*

[monguet@ege.upc.es](mailto:monguet@ege.upc.es)

[jfernandez@ege.upc.es](mailto:jfernandez@ege.upc.es)

[fabregas@ege.upc.es](mailto:fabregas@ege.upc.es)

[moron@ege.upc.es](mailto:moron@ege.upc.es)

## ***Summary***

This paper describes the set of courses that make up the distance multimedia degree studies offered by the UPC in conjunction with the UOC. These courses are designed to meet the increasing demand for continued education by integrating the advances in information technologies currently arising from new paradigms in distance learning.

The study plan has been specially designed and is fully interdisciplinary. The plan draws on three areas of knowledge: creation and design of the programme content, marketing and management of multimedia production, and computer and communications technology.

The educational model seeks a balance between practical activities, similar to those students are likely to undertake in the workplace, and theory-based reading tasks aimed at furthering and consolidating their grasp of the concepts involved. The model is structured around three elements: self-access material, virtual activities, and real activities. The self-access materials and the assessment system give the student continued feedback on their progress.

The average age of the students is 32.3 years (range 19–55). Most are men (77%), and 60% are pursuing university studies for the first time.

A key element of the distance multimedia studies is the involvement of the teachers in the preparation of the multimedia teaching materials. This role means that they must be trained in materials design and must use models of specific contents.

The activities of the course tutor and the general tutor combine a proactive attitude with rapid response to the questions that arise as part of the Distance Multimedia Degree.

## ***Introduction: Scenario***

The rapid scientific and technological advances of today's world have important repercussions for many aspects of people's lives and for the structure and dynamism of society in general.

This means, among other things, that professionals in practically all sectors need to update their knowledge continuously. The role of "knowledge" in productivity, the importance that companies attach to it and professional mobility are related phenomena.

The need for in-service training and advances in information technologies has led to deep-seated changes in traditional Distance Education (DE). The technologies and methodologies used in DE play a critical role in this transformation. Internet, for example, offers enormous educational possibilities, providing easy access to information, promoting exchange of knowledge, and increasing the capacity for interaction during the educational process.

The use of these new tools raises some important questions. How can we hope to absorb the vast quantity of knowledge and information available? How can we hope to keep up with the latest developments?

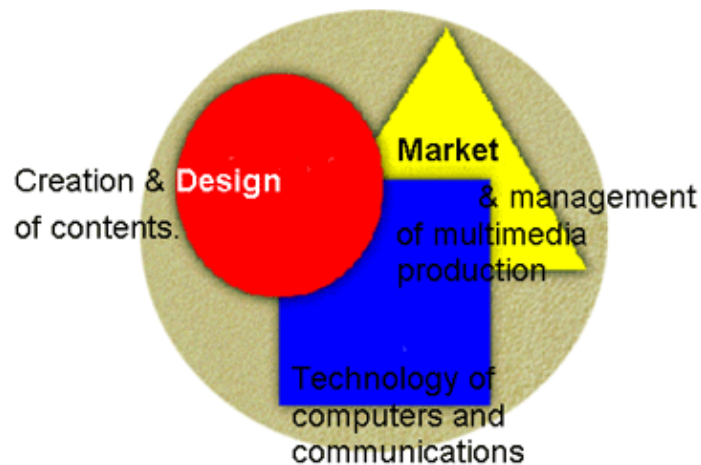
This table outlines the main elements of the UPC distance multimedia degree.

<p>Increasing demand for continued education.</p>	<p>Analyses show that the coming years will see a significant increase in the demand for continued education. A recent study carried out in Spain predicts a growth of 400% during the next 10 years.</p>
<p>Continuous advances in information technologies:          ·Internet.          ·Multimedia communication</p>	<p>The evolution of technology has a major impact on the implementation of distance education solutions. The process of convergence of technologies and services will define how we will use networks and devices in the coming years: image, mobile real time communication, and so on. It is a reasonable prediction that our use of technology will develop and change radically every few years.</p>
<p>Emergence of new paradigms in distance learning.</p>	<p>A rapid evolution from simple paradigms such as programmed learning, (simple, but not necessarily widely used or known), to more sophisticated paradigms such as co-operative and distributed learning. In this process, Internet and multimedia communication play a critical role, offering enormous educational possibilities: Interchange of knowledge Increased capacity for interaction during the educational process Improved presentation of educational information.</p>

## ***Introduction: the Studies***

The study plan has been specially designed and is fully interdisciplinary. As the following table shows, there is a balance between three areas of knowledge.

<b>Subjects</b>	
Creation and design of content.	Students work with subjects such as video, graphic design, animation, human computer interaction, music and so on.
Market and management of multimedia production	Business administration, marketing, analysis of economic sectors, and of course methodology of multimedia production.
Creation and design of content.	Networking, acoustics, digital video and programming, based on mathematics (digital information) and physics (information technology).



All these subjects progress in parallel; simultaneously, students work on improving their technical skills, their understanding of design, and their understanding of the marketing and administration of information technology.

## ***Introduction: the Studies. Orientation***

The educational model seeks a balance between practical activities, similar to those students are likely to undertake in the workplace, and theory-based reading tasks aimed at furthering and consolidating their grasp of the concepts involved.

Conceptual knowledge	<p>The treatment of the content and the type of exercises used continuously seek a balance between theory and practice. The subject areas selected for these studies are:</p> <p>Mathematics: in particular, computational geometry and the fundamentals of digital information.</p> <p>Physics: computer technology and telecommunications</p>
Professional abilities	<p>Only a few lectures focus on technical tools such as drawing programs. From day one we encourage the students to learn how to use the tools by themselves, thus preparing them for the real situation as soon as they leave the school. Students are offered all the facilities, support, open laboratories, tutorials, etc., they may require.</p>

Since the school was launched three years ago, many job opportunities have appeared for students. The table summarises the main areas of professional demand in the market.

Companies working in the media	<p>The companies which work with the media as raw material: Editors in TV and the press. These companies are immersed in the process of convergence of technology and services in the multimedia industry.</p>
Information technology companies	<p>Students receive special preparation for the hybrid role (incorporating both technical and commercial aspects) required in particular by today's telecommunications and consumer electronics companies.</p>
Sales and marketing in any company	<p>The emergence of e-commerce will generate new demand for professionals with qualifications such as the multimedia degree.</p>
Training and education	<p>In universities and other educational institutions, support specialists are also needed to help lecturers apply these new "digital activities".</p>

### *The model: The same studies in distance mode*

During the last quarter of 1999, the UPC multimedia studies were adapted to distance mode. These are the main aspects of the project:

Student catchment area: Spain.	The distance mode has no frontiers. In practice, however, limitations are imposed by: <ul style="list-style-type: none"><li>· language</li><li>· capacity for providing real support to the student</li></ul>
100% distance training supported by tutors and course tutors.	To date, the approach has been based on an on-line model, with direct contact with students once a semester on the day of the evaluation. For next year new activities are planned to increase the contact with students: Direct TV, Videoconferencing, etc.
Continuous distance assessment.	With continuous distance assessment, there is no need for students to sit a final exam.
Multimedia self-access materials created by professors in the GIM Multimedia Laboratory (GIM: Multimedia Research Group)	The multimedia materials are produced by a team of experts in a research laboratory. The main advantage of this system is its flexibility: specifications for the multimedia materials can be modified as necessary. The main disadvantage is the limited budget.

## *The model: Non-presential learning*

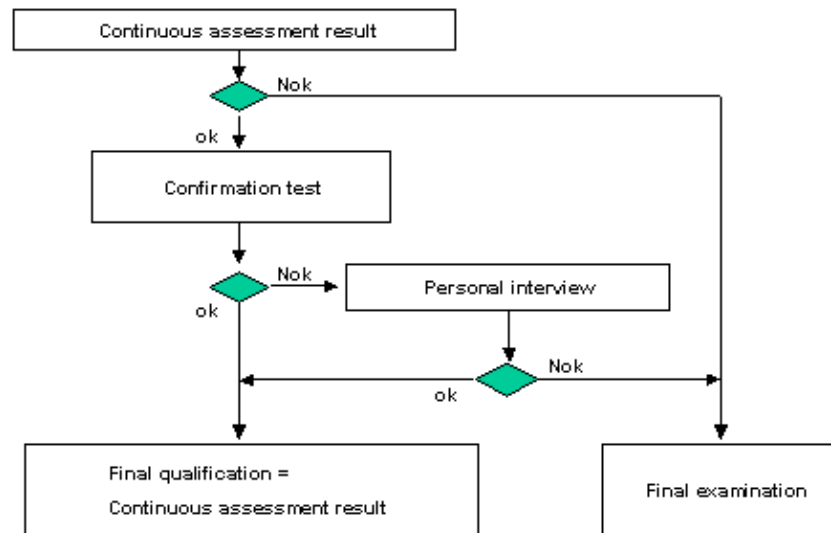
The educational model is based on three elements:

Self-access material	<p>All the core contents in each subject are produced in multimedia format. The model is highly integrated and the material self-contained: all the students' needs are covered by the CD-ROM.</p> <p>The first three subjects were presented on a CD-ROM. The second group of three subjects is presented partly on CD-ROM and partly in WEB format.</p>
Virtual activities	<p>The most important virtual activity is course tutor and general tutor support. Each student has a general tutor who helps with various aspects, such as offering advice and communicating the results of the assessments. When students enrol, the general tutor is responsible for advising them how many subjects to take. During the year, the general tutor may advise a student to concentrate on a particular subject, depending on the evolution of his/her work.</p> <p>The course tutor helps the student with the material inside a particular subject. He or she answers doubts and questions, and corrects the student's practical work.</p>
Real activities	<p>In the first year hardly any real or "presential" activities were organised. Next year different methods are planned, such as direct TV and videoconferencing, in order to strengthen the relationship between the student and the virtual school.</p>

## *The model: Continuous distance assessment*

One of the major components of the model is continuous assessment of the students.

A student who satisfactorily completes the exercises and questions during the course does not need to sit the final examination.



As the assignments are done at home without supervision, we need some way of checking that it is in fact the student in question who is doing the work. Students must pass what is called a confirmation examination before the continuous assessment mark is accepted.

If we detect a discrepancy between the marks in the continuous assessment and the confirmation test, the student is called for an interview with their general tutor and their course tutor in the particular subject. In this interview the tutors either accept the continuous assessment mark or decide that the student should sit the final examination.

Perceived self-efficacy ("student's judgments of his/her capabilities to organise and execute courses of action required") constitutes a predictor of the motivation and the effort that will develop during the learning process.

Students' perceptions of their progress during the self-access process directly influence their expectations of self-efficacy and, in consequence, their motivation.

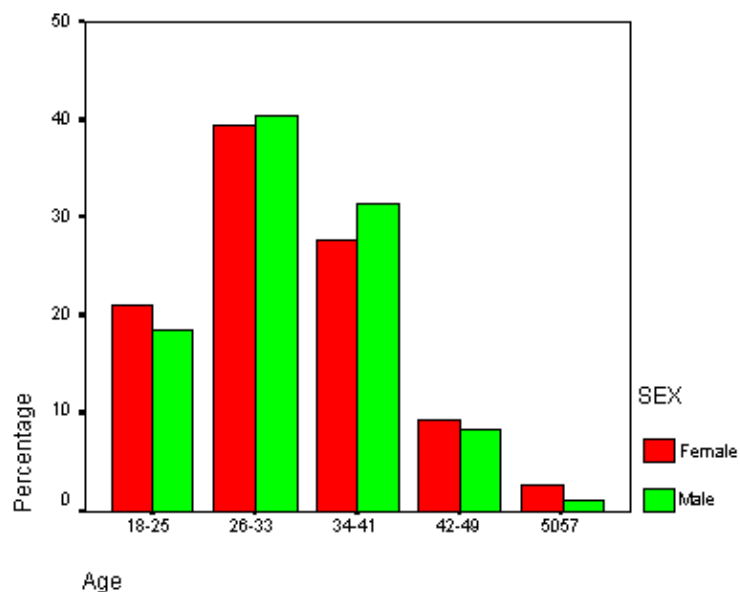
To keep motivation high during the study process, students require feedback on their work. Continuous self-assessment provides objective feedback on progress and is, in our view, another advantage of distance education through computers and Internet.

The overall system and the multimedia materials used in distance education must incorporate functions that allow continued self-evaluation and accurate feedback on progress. The system must be based on a philosophy of collaboration that permits the transfer of information between student, general tutor and course tutors to give them an accurate idea of the learning process of each student. This communication will doubtless improve the effectiveness of the continued support that is offered.

## *The students*

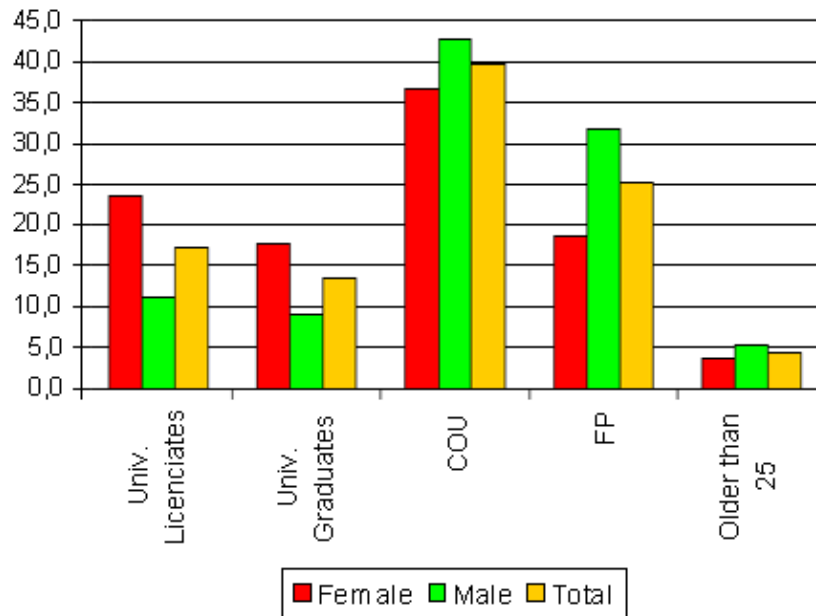
Total students	392
Male	77%
Female	23%

There is no obvious explanation for the high percentage of men. We are currently preparing a questionnaire to administer to the students which, we hope, will suggest reasons for the fact that women are so under-represented. The situation at the Multimedia School in Terrassa exactly the same.



The figures show that the distance degree has mainly attracted people between 26 and 41 years old. The average age of the students is 32'3 years (range 19–55).





For most students – 60% – this is their first experience of university study. The other 40% are continuing their training with a 3–year postgraduate continuous education degree. A 3–year degree in distance mode takes, on average, 5 years to complete.

The professional background of the group of students is extremely varied, though some groups stand out:

- Teachers
- Graphic designers
- Administrative workers

The graduate studies begin each six months. In February 2000, 250 new students will enrol.

### ***The teachers at the Multimedia School***

Each student has a general tutor and a course tutor for each subject. So, for each subject taught at the Multimedia School, there are:

- Teachers who have written the materials, usually working in a team.
- Teachers who teach "normal" classes at the Multimedia School.
- Distance Course tutors.

In addition, there are:

- Distance tutors
- On campus tutors
- Distance subject co–ordinators
- Normal subject co–ordinators

*A dual role: as authors of the self-access material, and as teachers*

<p>Teachers trained in design of multimedia teaching materials.</p>	<p>Teachers need special training to produce self-access materials. We are currently developing a teacher training plan focusing on training multimedia materials authors. The training concentrates more on the design of visual aids and the organisation of content than on the use of computer software for programming.</p>
<p>Use of content models.</p>	<p>The authors look at different models with a view to using them as references. The technical work is transparent to the teachers. The scripts they prepare and organise with the help of the content models are the basis for a kind of digital printing press. Some models allow authors to edit the content directly.</p>
<p>Protocols of student-general tutor and student-course tutor relations.</p>	<p>Students receive messages from their course tutors and general tutors at least once a week. General tutors and course tutors answer questions or doubts in less than 48 hours. We are developing a protocol of communication which combines:</p> <ul style="list-style-type: none"> <li>◆ Proactive attitude of the general tutor and the course tutor</li> <li>◆ Help and rapid response to questions.</li> </ul>

*Strengthening the authors' teams*

<p>First step</p>	<p>The studies were initially written by teams consisting mainly of lecturers at the UPC's multimedia school.</p>
<p>Second step</p>	<p>Search for course tutors and general tutors in Spain and Latin America with potential as materials authors. Integration of authors from other universities in Catalonia and Spain.</p>
<p>Third step</p>	<p>Heightening of participation of course tutors, general tutors and authors. Introduction of new authors, both in currently existing subjects and in those under development.</p>

## Costs

The success of the studies mainly relies on three things:

- Quality of the learning materials
- Quality of personal support given by the general tutor and the course tutors
- Quality of the virtual–real environment: library, support to student teams working in conjunction, etc.

Authors	<p>A range of formats, depending on the legal provisions for intellectual property:</p> <ul style="list-style-type: none"> <li>◆ Group work</li> <li>◆ Individual work</li> </ul> <p>The financial aspect must also be discussed with the author. The model accepted for the Multimedia Distance Degree granted exclusive rights to the use of the materials created. The authors receive part of the income.</p>
Course tutors and general tutors	<p>The teaching team has to work with a high degree of co–ordination and must take advantage of economies of scale.</p>
Virtual–real environment	<p>One part of the environment is well supported by Internet, but it is important to organise Internet users in an effective way. A great deal of research is required to improve communication between students and professors through Internet.</p>

## Conclusions

This is the beginning of the beginning.

All our conclusions are based on the data collected as part of the Distance Multimedia Degree, and are summarised in this final table.

Teacher support for students	<p>The role of the course tutor is very important. If the programmed learning is good enough, then the questions and doubts of the student will centre on the exercises and the personalisation of the content to the particular interests of the student. This leads directly to more attractive and efficient learning.</p>
Flexibility	<p>Obviously, one of the main advantages of DE is that teachers and students have flexibility to organise their time and place of work.</p>

	<p>Our experience suggests that it is possible to maximise this flexibility, for instance by offering students different rhythms or schedules: one student would need a full year for a subject but another may need only four months.</p> <p>Obviously management of a DE programme in which each student follows their own schedule is more complex, but the advantages are significant.</p>
<p>Improve the personalisation of training</p>	<p>With the data from the first semester, we are currently examining the relationship between certain characteristics and personal students' skills and their behaviour:</p> <ul style="list-style-type: none"> <li>◆ Interaction between teachers and students</li> <li>◆ Use of information and knowledge</li> <li>◆ Results in the regular assessments</li> <li>◆ Anxiety in relation with the use of technology</li> </ul> <p>This last point was the most important, even though special connections were provided for our students.</p>
<p>The evolution of technology</p>	<p>In our particular situation, students are learning how to use technology as a tool to sell, teach, play, etc. For this reason they are especially sensitive to and critical of the ways in which information technology is used: quality and creativity of videos and graphics, communication possibilities, etc. We do not know how to translate this to other subjects and studies.</p>
<p>The influence of distance learning studies on normal studies</p>	<p>All the resources we have developed for the DE studies are available to the young students at the Multimedia School. This year we have carried out a pilot scheme involving the substitution of typical classes by meetings with the personal tutor and more open work in the school's laboratories. The results of this trial in the three subjects were quite good. Next year we will extend the method to three new subjects, and introduce certain changes in the light of our experiences this year.</p>
<p>The coherence of the study design</p>	<p>The multidisciplinary orientation of the studies differs slightly in distance and presential modes:</p> <ul style="list-style-type: none"> <li>◆ With the in situ students, we find that the greatest difficulty lies in the differences in approach to the subjects: some are scientific–technical, others artistic and others are socio–economic. We must bear in mind the level of maturity of the students. In fact we introduce technology and art first, and then management in the second year.</li> <li>◆ For distance mode students over the age of 35, the multidisciplinary approach is ideal</li> </ul>