

Guide for authors

InterUNT – Production and pedagogical cycle groups

Index

Index

Some teaching aspects	3
Structuring documents	3
The analysis of training requirements	4
The importance of learning objectives.....	5
Pedagogical strategy	5
Indexing.....	6
An introduction to technical design	7
Help with creating lessons.....	7
Help with writing exercises	9
Help with creating activities	12
Glossary, bibliography.....	13
Conclusion	15
Glossary	16

This guide presents the different key stages in designing digital teaching resources destined for shared use (in a digital university for example) or for wider distribution (publication on a web site).

It contains information on teaching, technical and institutional aspects such as legal, communication and graphic elements and is aimed at helping all authors of digital teaching resources. Its goal is to provide the most straightforward help possible and as such it is a basic document which presents essential information and elements. Further details on this information can be obtained by consulting the references provided.

You can also obtain valuable help from staff working in the digital area in your institution (ICT cell, Digital department or others).

Legal reminder

It is important to bear in mind that, as stipulated by article L. 111-1 of the French Intellectual Property Code, author's copyright protects all "original intellectual works". Consequently, whatever the worth of an author, the form given to his or her work or the use which is made of it, his/her work will be protected by author's copyright as soon as it leaves the author's mind and is put into a form third parties can perceive and which will reflect the personality of the creator (originality). This means that all digital teaching resources you create will be protected by author's copyright.

More information is available at:

<http://www.universites-numeriques.fr/content/quest-ce-quune-%C5%93uvre-prot%C3%A9g%C3%A9e-par-le-droit-dauteur>.

Some teaching aspects

Structuring documents

A teaching document is above all a logical document with its own "architecture". This means you first need to structure your content using a plan defining the sectors, sub-sectors and/or activities you wish to propose. This corresponds to what we might call the notion of the "instructional object ". The way documents need to be broken down into units of meaning or "objects" which are independent in terms of understanding is highly important because if each part is autonomous, they may be put back together differently for another usage context (additions, change of order, deletion). The different instructional objects which make up the resource therefore need to be thought out and built during this first phase - the pedagogical scriptwriting of the resources.

An instructional object corresponds to the smallest possible unit of the pedagogical scenario. It has its own underlying pedagogical intent, is based on one or more learning resources and is expressed through one or more activities. It should be possible to use it to evaluate learning. This means that

an instructional object is an element of a pedagogical resource (a complex structure) which can also be used as a stand-alone element. It needs to be distinguished from individual media (a diagram, table, video without commentary, a photo or any other type of iconography) which cannot be considered to work on a stand-alone basis in a teaching context.

Instructional objects should also be distinguished from learning sequences. They are all autonomous and independent. It should be possible to use them in other resources as well as the one for which they were constructed. The size and/or duration are not set-in-stone criteria for breaking down a resource although it is essential to keep the idea in mind.

- As stated above, an instructional object is the smallest indivisible part of a resource. It presents an "idea" or "notion". In more concrete terms, it may be in the form of a page of text describing a sole idea illustrated by different media or perhaps an enriched video (with commentary or subtitles).
- A learning sequence is an assembly of instructional objects to make up an autonomous structured whole presenting a "concept" drawing on several ideas and notions.
It might for example be in the form of a lesson or case study.

The analysis of training requirements

The resources put on line by Thematic Digital Universities (TDUs) often target several audiences with different requirements and expectations. The same resource might be consulted by an individual student looking for further reading material as back-up to his/her "in-person" lessons. A teacher might also use the resource in class using a teaching method adapted to his/her context and content adapted to students in initial or continuing education.

Nevertheless authors may still choose to tailor their work for a certain type of audience. In that case, the specific nature of the students needs to be considered beforehand and the scripting and instructional objects adapted accordingly.

- Is the resource to be used for self-training alone although it could be enhanced by or require a teacher's accompaniment?
- Is the resource meant for initial training, continuous training or both?
- What is the level of the target audience? Undergraduate students, master's level or teachers?

The importance of learning objectives¹

We first need to make a distinction between general objectives and the objectives of each instructional object.

Next, the best way of expressing each objective is through the following phrase structure: "At the end of the course, learners will be able to [INSERT VERB] to the expected level of performance".

A learning objective refers to a skill or skill-set which learners need to have acquired when they finished using the resource. The skill level learners need to attain should be described in detail and should be performable with observable and measurable behaviour. The context in which the skill is to be performed should also be stated. A correctly formulated learning objective directly leads to the definition of how it may be evaluated.

Steps to follow:

- Write a sentence describing the expected performance level for the target skill using a verb expressing observable action or behaviour.
- The objective should be formulated in terms of results (and not in terms of the means required to learn).
- To increase clarity, the objective should also state the conditions of the skill being performed.
- The learning objective should also indicate the criteria for its own success.

Examples: "*be able to define (in writing) the notion of historicity*" is better than "*understand the notion of historicity*"; "*Be able to calculate the hypotenuse of a given right-angled triangle*" is better than "*Know what Pythagoras' theorem is*".

For further information see: R. Mager, "Comment définir des objectifs pédagogiques" (*How to define pedagogical objectives*), Dunod, Paris, 2001 (1^{ère} ed. 1977).

Pedagogical strategy

There are different learning modes which depend on one's approach and enable the construction of different types of pedagogical strategies.

- **The expository mode** (behaviourism and cognitivism):
The teacher coherently shows, demonstrates and explains the knowledge to be taught.
Students are spectators.
Examples: lessons, exercises, videos etc.

¹ R. Mager, "Comment définir des objectifs pédagogiques" (*How to define pedagogical objectives*), Dunod, 2001 (1st edition 1977). It is interesting to note that this term is polysemous. We have opted to use the term learning objective.

- **The participative mode** (constructivism and socio-constructivism)
The teacher provides meaning for the knowledge to be learnt by creating problems to solve.
Students are active and involved. They participate and jointly construct their own skills.
Examples: case studies, role-playing games, interactive exercises etc.

A digital pedagogical resource can be constructed in the expository or participatory mode or may involve both these pedagogical strategies.

For further information see: P. Moeglin, "Outils et medias éducatifs. Une approche communicationnelle" (*Educational tools and medias. A communicative approach*), PUG, Grenoble, 2005.

Indexing

Your resources need the highest possible level of visibility to be useful and used in the best way and the more autonomously referenced independent units they are composed of, the greater that visibility will be. Ideally each of the instructional objects should have a maximum level of granularity and be indexed. This will increase the chances of users finding your resources whether they be students/learners or teachers.

Clearly teachers may not find it easy to re-use resources and instructional objects constructed by other teachers. However, certain well-structured instructional objects offer high added pedagogical value - particularly interactive or simulation exercises, case studies and so forth.

It is important for others to be able to use them in their lessons and, to enable this, the resources need to be accompanied by a precise dataset providing detailed and in-depth information on the contexts they may be used in.

For the author this indexing work covers all elements necessary for his/her instructional design work and thus does not involve any extra work. Enhanced indexing is done by document specialists who can also use the Sup-lom-fr standard to help you with any questions you may have regarding referencing either in your home institutions or in Thematic Digital Universities.

You need to provide the following essential information:

- title,
- author,
- short description,
- keywords,
- date of creation,
- level,
- learning objectives,
- estimated duration of learning time required,

- any possible prerequisites.

With the above information, you will then be able to work out and construct the different instructional objects which will make up your resource. According to your pedagogical strategy and how your content is to be structured, this design work may differ. As stated earlier, there are different types of pedagogical productions which you may combine if you wish and the following elements should enable you to construct your resource.

In other words, according to your chosen strategy, you will have broken your resource into units and the way they follow on from each other will depend on your pedagogical strategy. We will now provide help with creating these units.

An introduction to technical design

Help with creating lessons:

In this help section we will see how using the "styles" provided with your word processing software can help to highlight parts of your lesson such as remarks and examples, the fundamentals and also chapter and sub-section titles.

This will help you identify the structure of your lesson better and make it easier for your resource to be reused, updated or integrated into a multimedia product (publishing process).

Here is an example of how to do this:

Title level 1 = Lesson or Chapter = the titles of your lessons or chapters

Examples: "Communication"; "Production demand systems, capacities and loads"

Title level 2 = Sub-sections = the secondary titles of lessons

Examples: "Events-based communication"; "Demand systems"

Title level 3 = Corresponds to the third level of your plan

Examples: "Choice of events"

Etc.

These are the basic elements for your plan and it is a good idea to use styles to give greater form to your pedagogical intentions as this will make both your resource as a whole and your instructional objects much clearer. We will now give an example of this method to help you put it into practice. The markers used therein are just examples and will of course depend on the document model to be created. It is a good idea to provide a plan of your markers or styles with a writing guide.

1 Lesson: Production demand systems, capacities and loads

This is the title of your lesson or chapter.

[Introductory Video]

[Comments to be inserted under the video]

The main objective of this lesson is to know and be able to use the notions of demand systems, capacities and loads.

At the end of the lesson, students will be able to:

- define the ideas of demand push/pull systems,
- define the main causes of variations in demand systems,
- define and use the ideas of loads and capacities.

1.1 Sub-Section: Demand systems

1.1.1 Introduction

All companies aim to deliver products to their clients when they are required. It is therefore to ensure effective production management...

1.1.2 Internal and external workflow

Supply flows can be grouped together ...

1.1.3 Demand push and pull systems

1.1.3.1 Introduction

Note: There are several types of order systems: custom manufacturing, stock orders or using short-range forecasting.

1.1.3.2 Push Systems

Let's look at the example of stock orders...

Diagram showing a push system

1.1.3.3 Pull systems

Essential information (which the student must remember and learn): When companies work with a demand pull system, orders are only manufactured when the next process workstation needs them.

Special note (draws attention to a particular point which may for example often be a source of error for students): Push and pull systems can co-exist.

1.2 Capacities and loads

1.2.1 Resources

Definition: All the means necessary to transform raw materials and components into finished products.

Example

Additional item

Exercises or simulation

Suggestion: Print the exercise description

The company RADIAPLUS manufactures and sells metal radiators for home central heating systems.

Their production system is made up of six main phases which are carried out one after the other in six workshops etc.

Methodological point: Absenteeism was not taken into account for questions 1, 2 and 3 with only machine capacity being considered...

Important note: In this exercise, you must take into account...

Help with writing exercises

This will be similar to the section on help with writing lessons in that it will involve simple illustrations. Our approach does not cover all possibilities.

SCQ (Single Choice Question)

Question

What are the colours of the Swiss flag

Proposed right answer (only one)

Red and white

Explanation (optional)

Proposed wrong answer(s) (one or more)

- Red and blue
- Green and white

MCQ (Multiple Choice Question)

Question

Which cities were the capitals of Germany during the last century?

Proposed right answer(s) (one or more)

- Bonn
- Berlin

Proposed wrong answer(s) (one or more)

- Hanover
- Munich
- Paris

General explanation or feedback (optional)

Matching exercise - Categorization

Instructions

Choose the symptoms of throat infection and gastroenteritis from a list of adjectives.

Answer

Target 1: Throat infection

Label 1 (one or more): sore throat – fever – inflamed throat

Target 2: Gastro-enteritis

Label 2 (one or more): sickness – vomiting – diarrhoea - fever

Matching exercise – Putting words in the right order

Instructions

Put the following words or phrases from the lesson on Pythagoras' theorem in the right order.

the square – of the squares – in a right-angled triangle – to the sum – of the hypotenuse – of the other two sides– is equal

Answer

1. In a right-angled triangle - 2. the square - 3. of the hypotenuse - 4. is equal - 5. to the sum - 6. of the squares - 7. of the other two sides.

Cloze test

Instructions

Fill in the gaps in the text below on the notion of the group.

Answer (put the "gap" words in bold)

When the notion of the group is considered from a system-based standpoint, a group corresponds to the formation of a group of individuals who **interact** in a given **environment**. The environment in which the group and its members evolve is seen as an **organised** set of restrictions.

Closed question

Question

What year did the Berlin wall fall (in figures)?

Answer

1989

Synonym (one or more, optional)

89

Explication (optional)**Written test****Title:** Conditions of visibility**Context**

Two people are in a room in front of a mirror on the wall. The first is sitting in an armchair and the other is standing behind the armchair. O_a represents the position of the eyes of the person sitting down and O_d the eyes of the standing person. They are respectively at 1m and 1.7m from the floor and 1m and 1.4m from the wall where the mirror is. The bottom edge of the mirror is 85 cms above the floor.

Question

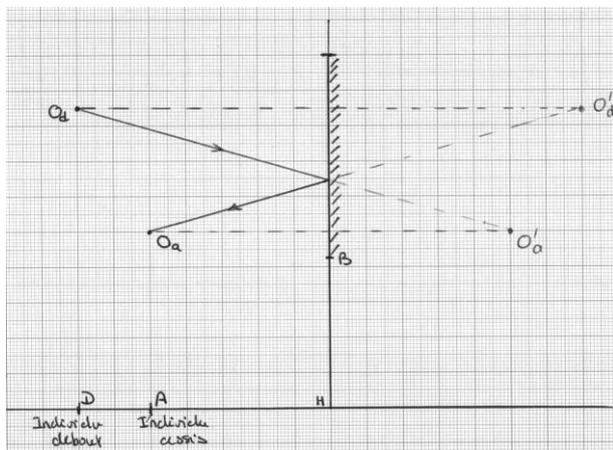
Can the standing person see the sitting person's face?

Hint (optional)

Draw a scale diagram of this situation working out the reflections from the mirror.

Answer

According to the calculation of reflected light, the standing person can see the face of the person sitting down.



Help with creating activities

Until now we have based our work on traditional methods. Of course other methods exist, particularly those which take skills as a starting point and involve constructing activities. These methods can be used alongside the document which has been our guideline until now.

When your learning objectives have been identified and formalised as exhaustively and coherently as possible, the next step is to find activities which will enable your students to attain those objectives.

Several different activities can be used to help reach a sole objective. These should be chosen according to any logistical restrictions or the teacher's own preferences.

To link the activities together, you need to first identify the different prerequisites involved. Prerequisites are a restriction and not just a simple progression through the activities.

For further information see: <http://greco.grenet.fr/bases/sommaire/100.php> G.P. Wiggins, J. McTighe, Understanding by design, Merrill/Prentice Hall, 2001.

Case studies

Students often want tangible applications linked to their lectures and classes and like being confronted with real-life situations. Case studies are a way of responding to that demand because of their realistic nature. They provide students with an original approach (when compared with more traditional exercises and tutorials) which is closer to the field and based on real cases (companies, figures, data, etc.)

It is also important for students to get the opportunity to test themselves by putting into practice the knowledge acquired and to have the opportunity to make mistakes. For this reason, the non-linear aspect of case studies can be an interesting approach because they can provide various possibilities. Some may turn out to be dead ends which, when explained, provide rich learning opportunities in themselves. From a teacher's point of view, case studies also provide the necessary content to illustrate ideas covered in class (real-life cases are generally hard to find or may be unusable for legal reasons).

Two examples of case studies are given below. For more complex exercises like non-linear case studies or script concordance tests², it is better not to use typical

² Candidates are presented with an authentic clinical situation described on a vignette. This clinical context would be problematic even for an experienced surgeon (either because there is insufficient or ambiguous information) and therefore there are various possible replies with varying degrees of probability. Several options for diagnosis, investigation or treatment are relevant in the context under study. Students are given one of the relevant options and a new piece of information (not included on the vignette) for example – "if you think of a heart attack and you find a ECG with a Q wave the hypothesis is reinforced a lot/a little, doesn't change, is weakened a lot/a little. Students then have to determine what effect this new data has on the status of the option. Answers are given on an Likert scale (positive +2, +1, neutral 0, negative -1, -2) to indicate whether the initial diagnosis or choice of treatment is strengthened, weakened or does not change. The tests are corrected based on replies of a panel of teachers who previously did the same SCT as the students.

scenarios and forms and rather to work in collaboration with an instructional design specialist.

Example 1: A clinical case in the field of pharmacy

1. Hospital admission form / patient's medical history
2. State of patient, description of symptoms
3. Exercises: suggest medical treatment, indicate which medicines would be appropriate
4. (Optional: evolution of the patient's condition, new symptoms... – return to stage 2 for structure)
5. Information to be retained: the message and knowledge this case study aims to pass on.

Example 2: Integrating an engineer into a company.

1. List of people involved in the case study
2. Introduction / micro-illustration
3. Storyboard or video
4. Analysis of behaviour (e.g.: "He doesn't wear safety equipment. Explanation of risks").
5. Suggestions for improvements (e.g.: "He should have it with him whenever he walks around the factory so it's ready if he needs it.")

The document does not cover everything and we could have discussed serious games, simulations, dissertations or commenting on documents for example. You may wish to consult articles on other categorisation modes and do not forget that documents can be associated with other activities by using other types of material.

Glossary, bibliography

Depending of the content of your document, it can be a good idea to include a glossary.

For this you just need to list all the terms which are important or may pose problems for learners and then add definitions. It should be noted that contextualised definitions are always more helpful than generalist definitions.

In any case, it is important to add a bibliography. This only needs to include the most relevant references and does not need to be exhaustive.

Generally a reference should include:

- **The author:** Give the full surname and initial of the first name for all authors (unless for example some were just collaborators on the book).

If there is more than one author but the work was directed by someone in particular, just include this name followed by (dir.).

If an institution was "the author", give the full name e.g. National Institute for Educational Research or Ministry of Education)

- **The title:** Give the full main title and in some cases the secondary titles. Book titles should be underlined or in italic.

Article titles should be in inverted commas and followed by the journal title or the author's name then the book name, all underlined.

- **Address:** for commercial Publishers (generally this is on the inside cover, first page or at the back. Be careful not to mistakenly include the printer's name. Generally there will be the copyright sign.)

Town of publication (ditto)

Year of publication (ditto). Sometimes the book may have been republished and in this case you should put for example, 1995 (3rd ed., 1st ed. 1968). This is generally on the on the inside cover, first page or at the back. If it is a revised, lengthened or corrected edition, this information should be included. For journals generally the name, issue number and date published will suffice and not the publisher or town of publication.

- **Page numbers:** For an article, include the relevant page numbers. For a book with more than one volume, include the volume number after the date.

To conclude this guide for authors we would just like to insist on the importance of indexing and the granularization of your resources.

The most interesting resource possible will remain unknown and thus unused if it is not visible, readable and easily findable by other people. The best solution is to either carry out enhanced indexing for your resource or ask a document specialist to do it for you. Nearly all the Thematic Digital Universities have document specialists who can help you.

Similarly the more the instructional objects that make up your resource are readable, the more visible the resource will be. Thinking out your resource as being made up of independent entities which can be consulted as stand-alone items will increase the chances of students or other teachers using it. For this and other subjects, particularly breaking down your resources, training courses are available and teams of professionals are there to help you (ICT cells, digital departments etc.)

We would also like to remind you that the documents you produce should comply with accessibility standards (please look at <http://www.w3.org/WAI/> or scenari-platform.org/projects/opale/.../guide-author-accessibilite.odt). Most of the suggestions are very simple and effective and often help improve teaching quality.

For more information on technical design, please see the document inter-UNT on Interoperability on the "Universités Numériques" portal.

Glossary

Case study: pedagogical form involving as systematic analysis of a situation aimed at finding solutions and solving a problem.

Content author: individual who creates the learning content of the learning resource.

Evaluation: Here this only concerns the evaluation of learning (not the evaluation of the resource or the teaching system). There are at least 3 types of evaluation: diagnostic, formative and summative.

- Diagnostic: This can be used at the start of the resource for example to measure if the necessary pre-requisites for its use have already been acquired by learners.
- Formative: The aims of this are to help learners learn, to inform learners as to what should be done and what they still need to learn and to help them situate their progress with regard to a given objective.
- Summative: This is done at the end of teaching and assesses the knowledge/skills acquired by the learner. It may count towards obtaining a diploma or certificate.

The form of the evaluation may differ. It could be:

- Integrated into the resource and able to be done on screen (as a multiple choice or other quiz, online exercise or simulation etc.)
- Not in the resource for example searching a precise subject on the web, writing a summary, carrying out a calculation and comparing solutions, etc.

Exercise: type of pedagogical activity aimed at getting learners to use a skill.

ICT: Information and communication technologies, here in education (*In French TICE, Technologies de l'information et de la communication pour l'enseignement*)

Instructional design: systematic and systemic instructional planning including needs assessment, design, evaluation, implementation and maintenance of materials and programmes.)

Instructional object: for the teacher this:

- is the smallest unit of a pedagogical scenario;
- involves a pedagogical intention;
- is based on one or more learning resources;
- is carried out using one or more activities;
- must lead to an evaluation of learning;
- must be able to be reused/reappropriated by other teachers ;
- is integrated into a learning sequence;
- requires a guide for users.

Interactivity: activity requiring the cooperation of several people or natural or artificial systems which act and adjust their behaviour.

Learner: person that learns.

Learning: acquisition of knowledge, skills or attitudes.

Learning objectives: description of a goal of training or learning in terms of the knowledge, skills, or performance expected of a learner.

Learning resource: an entity that can be referenced and used for learning, education and training.

Learning sequence: A training module made up of several instructional activities and with one or more objectives.

Lecture: pedagogical form involving teaching in a lecture hall or at a conference.

Pedagogical prerequisite: prerequisites are the knowledge and skills students need to have previously mastered to a sufficient level to be able to start studying a new concept and/or acquire new skills.

Pedagogical scenario: a structured, transferable descriptive document presenting the following to varying degrees of detail: those involved (students, teachers), objectives, the knowledge and know-how the teacher aims to pass on, the way pedagogical sequences follow on from each other, contents, lesson elements, the list of planned activities, tools and I.T. resources to be integrated along with how to integrate these, the assessment method for an activity, group of activities or the whole sequence.

Role playing game: A role playing game is a technique (interpretation), an activity in which a person plays the role of a character in a fictional environment or a book giving the necessary details on how to play the role of a fictional character in a specific fictional environment. Participants make real actions and decisions or narrative actions to play their role and influence their characters' development.

Serious game: software programme which combines a serious intent (pedagogical, informative, communicational, marketing, ideological or for training) with a ludic approach.

Simulation: configurable representation of reality based on a model (modelling of a physical phenomenon, a trial in court, diagnosis, evolution of financial phenomena etc.).

TDUs - Thematic Digital Universities (*French: UNT, Universités Numériques Thématiques*)

Teaching activity: a teaching activity can be defined as that which learners are given to do and can be easily characterized by the instructions given and the expected results produced.

Training: development of skills and/or understanding through procedurally defined learning activities focused on a specific application.

