



PERSONALISED CURRICULUM BUILDER IN THE FEDERATED VIRTUAL
UNIVERSITY OF THE EUROPE OF REGIONS

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Abstract	<p>The report gives a detailed study about possibilities to automate the decision whether two courses can be exchanged against each other in a study programme. The European Credit Transfer System (ECTS) is an important step in this direction, but alone it is not sufficient to automate this task. ECTS uses credit points to model the extent of a course. To ensure exchangeability, the system must also have knowledge about things like the placement of the courses in curricula to model their difficulty, and their types of examination.</p> <p>The first part of the report thus reviews the goals of the Workpackage and the history of ECTS and gives as a case study the use of credit point systems, in particular ECTS, in Spain.</p> <p>The second part of the report presents the findings of a questionnaire circulated among departments all over Europe, to reveal the parameters and rules used in comparing two courses for exchangeability. In addition to the parameters and the rules, the questionnaire also asked for responsibility issues for the decisions about course acknowledgment.</p> <p>The main result of the questionnaire search is that the current metadata scheme 2.0 includes all fields necessary to represent parameters used in course comparisons. A further result is that the current procedures can be formalized and automated, because the comparison decisions are based on a small set of additional comparison parameters.</p> <p>Although the procedures and parameters derived attempt to model the current practice as closely as possible, the CUBER system cannot give guarantees on its results. However, as the ultimate responsibility for a decision about course exchange and acknowledgement anyway rests on the department offering the programme, this is not a serious restriction.</p> <p>Key words: course acknowledgement, ECTS, metadata, questionnaire</p>
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1. Introduction

1.1 CUBER and Credit Points

The CUBER system is to be a brokerage service which provides a user with information of courses offered by different European distance universities and other higher education institutions. A detailed information will be needed when a learner plans to build his curriculum from a collection of courses from different providers, or when a learner wishes to substitute courses of one provider with the ones of some other. In both cases the exchange of studies is usually restricted with some study transfer criteria set by the educational institution that awards a degree or other certification of studies for the learner.

The European Credit Transfer System, ECTS, is a standard that is to help the transfer of studies in the European educational market and to unify the credit recognition system within Europe. At the moment, ECTS is being used for evaluating the extent of a study course with credit points, which are given according to certain criteria and calculation methods. There are also plans to extend the ECTS beyond simple credit points towards more comprehensive standardisation of studies, which includes, for example, grading standards. Anyhow, to satisfy users' educational needs, CUBER has to offer the possibility to utilise the ECTS standards.

The possibility to study virtually, in the distance, will increase the need for study exchange. More learners will want to substitute their studies with other providers' studies because of personal interests, needs, and preferences. Flexibility must be offered, but within a tolerable framework from the organisations' point of view. Possibly a course can be substituted by one with differing content, but not by one with differing difficulty. In other words, there must be certain requirements for course transferring, that can be detected, defined, and integrated into the CUBER system. The experiences can be collected from the partner organisations of Workpackage 9, who represent the situation in eight European countries. Representing also different types of higher education organisations, with their contribution the partners can also give a viewpoint to varying educational interests and conventions.

The learner will use the CUBER system through the Search Engine, which is developed by the Workpackage 7. One of the main objectives for the Search Engine is to help the learner to compare studies by offering means to sort and organise them on the search interface by a desired set of criteria. The criteria, the details of studies, are defined in the CUBER meta-data schema, that is produced by the Workpackage 3. Content providers, on their behalf, will use the system through their own interface, the Authoring Interface, which is developed by Workpackage 4. The needs of content providers, including the requirements for credit recognition, are detected and defined by the Workpackage 6. Due to these connections, the credit point integration required close co-operation with these Workpackages 3, 4, 6, and 7.

The credit point system integration process, i.e. the work of Workpackage 9, has been divided into two phases. The first phase consists of more preliminary work: the study of current ECTS standard, the specification of course transfer needs, the analysis of meta-data, and finally suggestions to the development of the system in regard to the course exchangeability and credit transfer system. The result of the first phase is the deliverable 9.1 (this report). The second phase will concentrate on the extension of the acknowledgement scheme to courses from third party providers, i.e. organizations outside the CUBER consortium. For these courses, no metadata are stored in the CUBER knowledge base. Also the parameters and their values chosen must be evaluated how close they reflect current practice in departments. Last, the impact of the results from the first phase results on the implementation of the system components has to be considered. The results of the second phase will be reported in the deliverable 9.2.

This report starts with a definition of the goals and a description of the work of Workpackage 9 in Section 1.2. Then, in Section 2, the history, philosophy, and the current status of the ECTS system is being described. Section 3 presents the current use of the ECTS in Spain as a case study. The actions for detecting the acknowledgement parameters and the found results are being explained in Section 4. The report ends to conclusions, which sum up the findings of the study in relation to the development of the system.

1.2 Goals and Description of Credit Point System Integration Process

The main objective for the Workpackage 9 first phase was to provide information of study transfer requirements and the current status of credit transfer systems. The information was to be integrated in the meta-data schema.

The first task was to investigate the ECTS standard. It was considered essential to study first, how the ECTS system served educational institutions in the recognition of studies, and how the system could be integrated in CUBER. It was important to find out the current status of ECTS development, and the current status of ECTS usage.

To collect experiences of ECTS usage and information of the possibly varying procedures of study transferring in different European countries and institutions, the partners of CUBER were invited to a workshop in Karlsruhe jointly organised by Workpackages 8 and 9 at the end of January 2001. The participants were supposed to present the situation in their home institutions, and also to give an approximation whether their procedures had resemblance with the common practise in their country. There were also visiting representatives from other projects and institutions in the Karlsruhe workshop, who gave valuable information about experiences outside the CUBER consortium.

Since it was foreseen that the ECTS standard was not yet fully developed nor fully adopted in Europe, the task of Workpackage 9 was also to investigate other criteria than ECTS points needed for course acknowledgement. In addition to ECTS points the system should offer other detailed information of studies, such as difficulty level and description of topic, to support manual or automated comparison and suggestion of exchangeable studies. To become a course broker service, the CUBER system should be

able to provide the learner with a variety of suggestions of courses that can be included in his curriculum. The system must also be able to provide a representative of an educational organisation with sufficient details for him to describe the exchangeability criteria.

On the basis of the information received from the Karlsruhe workshop, Workpackage 9 developed a questionnaire to study current study course recognition criteria and procedures among the partner organisations. The questionnaire was delivered to Workpackage 9 members in May, and their comments and feed-back was requested for. Also preliminary answers were expected, in order to find possible lacks in scope and details. The final improvements to the questionnaire were discussed during the Workpackage 9 meeting in Barcelona in the end of May 2001. Soon after the meeting, the final questionnaire was distributed to the partners, and thereafter, answers received within a reasonable time-scale. The results from the questionnaire were analysed and suggestions for the possible integration were made. The results are being reported in this deliverable.

According to the Technical Annex of the CUBER contract one of the first phase tasks of the Workpackage 9 was the integration of results into the meta-data schema. When the work of Workpackage 9 began, there was the first version 1.0 of CUBER meta-data schema available. Found credit transfer criteria and integration procedures could be reflected to the new versions of schema. Should there be a need for revision, the suggestion was to be made by Workpackage 9.

Due to personnel changes in the Workpackage 3 there were delays in the meta-data development. However, the delay did not affect the work of Workpackage 9, since the same meta-data schema 1.0 was valid during the tasks of phase one. There were new meta-data versions first in May 2001 and later in August 2001. Being reported in September, the results from the first phase study can be well considered in the final meta-data schema, which is to be delivered in the end of October 2001.

Development of more detailed models, further integration to the CUBER system, and the final implementation of the credit transfer was to be the task of the second phase.

2. ECTS History and Philosophy

2.1 Credit Points in Higher Education Development

Ever since 1998, when the *Declaration of the Sorbonne* was made, a process has been set in motion to promote convergence between the higher education systems of the different countries of the European Union. In 1999, in the University of Bologna, 29 European ministers agreed to create a *European Higher Education Area* by the year 2010.

The Declaration of Bologna paves the way for the construction of a “European Higher Education Area”, organized along the lines of certain principles (quality, mobility, diversity, competitiveness and orientation), and which would be designed to achieve two main objectives: boosting employment in the European Union, and turning the European Higher Education System into a magnet for students and teachers from other parts of the world by creating a quality educational system which may be exported all over the world and which is competitive internationally.

The following targets are given in the Declaration of Bologna:

- ⇒ Adopting an easily comprehensible and comparable degree system, by means of the introduction of a *Supplement to the Diploma*, amongst other initiatives.
- ⇒ Adopting a system, which is basically built around two main cycles: undergraduate and graduate. The qualification obtained upon completion of the first cycle will have to have a specific value in the European job market. The second qualification will lead to obtaining a Master’s Degree and/or Ph.D, as is the case in many European countries.
- ⇒ The development of the *European Credit Transfer System* (ECTS), which allows credits studied in different European universities to be recognized.
- ⇒ Promoting the mobility of students, teachers and technical and administrative staff, by means of removing the barriers which prevent free movement.
- ⇒ The promotion of the European dimensions, which are needed in higher education, particularly regarding development of curricula, collaboration between institutions, mobility plans and integrated study programs, training and research.

All these objectives are being discussed at different levels in most of the states of the European Union, with the aim of achieving the hoped-for “harmonization” advocated by the Declaration of the Sorbonne. Different kinds of debates are being held to evaluate converging academic programs in order to ensure the quality of teaching, with the adoption of the credit transfer system which will allow for immediate academic recognition of qualifications and mobility between countries.

Universities in Spain have used the commissions of the *Conference of Spanish Rectors* (*Conferencia de Rectores Españoles*, CRUE) to work on adapting the present university system in Spain to the directives of the abovementioned Declaration of Bologna.

2.2 ECTS History

In 1987 the European Community adopted the ERASMUS Program (European Community Action Scheme for the Mobility of University Students) in order to raise the quality of education and the “European Dimension of Culture”. The ERASMUS program shows without doubt that study periods abroad are a particularly rewarding experience, not only because they are the best way to discover different countries, ideas, languages and cultures, but because they are also an important asset which is becoming increasingly valuable in the development of university and professional degrees.

In the year 1999-2000 a total of 1,764 contracts were made between different institutions. A total of 218,000 students - of whom 16,200 were Spanish students – were able to benefit.

Two of the main obstacles for the use of this program were the adaptation of study programs and the recognition and transfer of both studies and qualifications. The recognition of studies and titles is essential for the creation of an open European area for education and training, in which students and teachers can move freely without barriers.

The ECTS (*European Community Course Credit Transfer System* or *European Credit Transfer System*) program got under way in 1989 with this purpose in mind. It took the form of a pilot project within the framework of the ERASMUS program, with the aim of enabling studies carried out abroad to be given academic recognition and for results to be transferred between institutions.

The number of higher education centres (faculties or departments) using the ECTS rose from 145 in 1989 to more than 1200 (5000 faculties or departments) in 1999. From 2000 on, the Socrates II ¹ program has included ECTS as a basic element of mobility, and the system is planned to be used in the Leonardo Da Vinci, Youth Programs and Tempus III programs until 2006.

The ECTS system has given ample proof of its efficiency since it was introduced. Indeed, the current aim is for it to be applied at a general level, not only for exchange students, but for all students in the European Union, so that work produced by a student may easily be recognized in terms of level, quality and training in all states.

The adoption of the ECTS credit system will involve a conceptual reorganization of all educational systems in order to adapt to the new models of life-long continuous education. This changes the initial meaning of the credit as an established value which could be easily transferred, and means it is also a valid means of accumulation for the different stages of education.

¹ COMENIUS (school education), ERASMUS, (higher education), LINGUA (Learning European languages), GRUNDTVIG (adult education), MINERVA (IT & Communication -TIC- in education); EURYDICE (observation and innovation of educational systems and policies); Joint action with other programs and accompanying measures.

Over the last ten years many member states in the European Community have made their own innovations to national credits within the framework of education.

National credit systems have clearly been created to achieve a huge diversity of local, regional, national and international objectives. For other countries, ECTS is their first experience within the framework of credit systems. Most countries have also reformed their educational systems in order to bring them in line with the realities of global education.

2.3 ECTS Philosophy

ECTS is a practical code which offers those concerned the necessary means to ensure transparency and to enable academic recognition via the use of credits and the organization of reasonable programs regarding the volume of work throughout the study period.

ECTS is based upon three basic elements:

1. Information about study programs and students' results
2. Mutual agreement between the associated centres and students
3. The use of ECTS credits, which represent the effective volume of work of a student

ECTS credits represent the volume of work that the student must undertake in order to pass each of the subjects, in the form of a numeric value (between 1 & 60) which is assigned to each unit of the course. They indicate the volume of work that each unit of the course requires with regard to the total volume of work necessary to complete a year of study in the centre. This can involve lectures, practical classes, seminars, practice periods, field work, personal study (in libraries or at home) as well as exams and other methods of evaluation. ECTS is therefore based upon the student's total volume of work and is not merely restricted to hours attended.

Moreover, the ECTS *qualification scale* is designed as a common unit for judging the quality of academic results. The object would be to enable national qualifications to be quickly and immediately converted so that they may be understood in all EU countries – essential for future insertion in the *Supplement to the Diploma*.

3. The Spanish education system – A Case Study

3.1 Credit Systems in the Spanish Education System

Under current Spanish laws², credit units are defined as units of accumulation which include academic hours (theoretical and/or practical classes), but which do not consider the work of the student at any point. Obtaining credits depends upon the systems of evaluation established by universities.

Spanish credits were part of a process of reform of universities and higher education in Spain in 1983. The process of reform³ aims for greater adaptation to professional demands and social changes, and is based on:

- ⇒ An attempt to cut the excessive number of class hours and length of degrees (using number of credits).
- ⇒ Greater role of practical teaching (experience in companies).
- ⇒ Incorporation of credit as a unit of evaluation of teaching⁴ (and not the workload it represents for the student) in order to allow for an opening up of study plans and greater flexibility in the student's curriculum.
- ⇒ Redefining of educational content and academic demands of study plans (establishing of common general directives for study plans in university degrees).
- ⇒ Organization of university education in a cyclical structure.

Organizing university education around a cyclical structure means an official qualification may be obtained after the first cycle is passed (lasting approximately 3 years): this will mean subsequent access to professional activity and also the continuation of studies in a second cycle (two further years). The *Pasarela* system often grants access from a first cycle to a second. There are studies which comprise only the first cycle, which, if passed successfully, allow one to obtain a qualification⁵ with an academic workload of no less than 180 credits. Studies of the first and second cycle (which last between 4 and 5 years approximately) have an academic workload of no less than 300 credits and allow one to obtain another qualification⁶. Doctoral studies, which are considered as studies of the third cycle, are also structured around credits and last between three and four years. In addition to these programs, which are considered as official, the universities may also offer what are called their own qualifications.

² Royal Decree 1497/1987, 27 November, by which common directives are established for study plans for university qualifications of an official character for validity nationwide.

³ Organic Law 11/1983, 25 August, of University Reform (LRU)

⁴ Use of the concept of education and not teaching given that the system is based on the academic system

⁵ Obtaining the qualification of Diploma, Technical Architecture or Technical Engineering

⁶ The qualifications are Graduate, Engineer or Architect

Spanish universities produce and approve their own study plans which lead to different qualifications. In addition, study plans for official qualifications have to be recognized at a national level in order for them to be valid all over Spain. In order to obtain this recognition, the universities have to take into account a series of directives established by the government. One of the features of the system is that it allows the existence of a minimum level of homogeneity for the different study plans for the same qualification. The establishment of these directives⁷ at a national level determines the automatic recognition of academic contents and periods undertaken in other Spanish universities. The credit system is really a credit accumulation system because the total value of each study plan is determined by credits and not by years – years are considered only as reference points for obtaining a university qualification.

The use of numbers of credits also means that certain aspects of length of degrees and number of hours may be regulated. The workload of academic classes to be attended varies between 20 and 30 hours a week, including practical teaching, with a workload of between 60 and 90 credits a year. Moreover, the theoretical workload should not go beyond fifteen hours a week in any circumstances.

Study plans are organized into a series of subjects which vary in terms of obligation, so allowing the student to have a certain degree of freedom and flexibility in the composition of his or her curriculum:

- ⇒ Core subjects. The same for all students who study a certain course in Spain⁸.
- ⇒ Subjects chosen by each university for the course. They may be compulsory or non-compulsory for the student.
- ⇒ Subjects that the student may study independently of his or her study plan and which provide the curriculum with greater flexibility and specialization.

The credit is also considered to be important in order to measure the proportion of each of these subjects in the study plans of the courses offered by each university⁹. The law establishes minimum and maximum numbers according to cycles¹⁰ and type of course (diploma and degree)¹¹.

⁷ Royal Decree 1497/1987, 27 November, by which common directives are established for study plans for university qualifications of an official character for validity nationwide. Royal Decree 779/1998, 30 April (and its subsequent partial modifications), by which general directives are established for study plans for university qualifications of an official character for validity nationwide (and subsequent partial modifications).

⁸ 30% of core subjects in the first cycle and 25% in the second

⁹ the university may choose approximately 50% of the subjects

¹⁰ no less than 120 per cycle

¹¹ no less than 180 credits for diplomas and no less than 300 for degrees

It is therefore clear that credit plays a major role in the Spanish education system and is a basic means of measuring contents. It ensures minimum and maximum levels regarding the cycle and the course. It also allows the student to have a certain amount of flexibility in the design of the curriculum.

3.2 The introduction of ECTS in Spain

There are many Spanish universities, which are in the process of introducing the *European Credit Transfer System* (ECTS). The ECTS has boosted mobility and the recognition of study periods spent abroad.

The participation of Spanish universities in European mobility programs has been crucial for the introduction of the ECTS system. In 1998/1999 Spain was the second-ranking contributor in the Erasmus mobility program and all universities introduced ECTS.

The Conference of Spanish Rectors (*Conferencia de Rectores españoles, CRUE*) has worked upon a mobility program amongst Spanish universities known as SENECA (June 1999). In this program the mechanisms of the ECTS system are used, taking a reference of 60 credits per year.

Spain presently has a system of credits, which is based upon contact hours; moreover, many universities use the ECTS system with exchanges. Neither of the systems considers the work of the student, however, and a revision is needed in order to evolve towards an ECTS, which really allows the workload of the student to be measured and to permit convergence with European credits.

Spain is therefore at a key moment with regard to the use of credit, and needs a solution, which provides, on the one hand, the organization and simplification of the system within the universities themselves (it is not logical to have two systems operating at the same time) and, on the other, greater transparency for European students.

On the 13th of December 2000, the CRUE approved a document which analyses the different features involved in adapting the Spanish university system to the directives of the Declaration of Bologna, and, by extension, to the European Higher Education Area.

The document already showed a general study of the value of credit according to the ECTS system and its history, with an examination of Spanish credits and convergence with the European counterpart. Reference was also made to the adoption of a qualification system similar to the ECTS system of qualifications and marks, and to the introduction of the Supplement to the Diploma in universities in Spain.

The following relevant points should be borne in mind with regard to the modification of the definition of Spanish credits towards European credits, which could be transferred and accumulated:

- ⇒ The credit has to be based on the work that the student has to undertake in order to have a proper education (knowledge and abilities). The contents of theoretical classes, practical classes, seminars, tutorials, etc., will depend upon the students' required degree of knowledge.
- ⇒ The concept of the unit of credit must reflect the work which is necessary in order to have a balanced academic education by means of appropriate apprenticeship which will provide the student with the ability to analyse.
- ⇒ The adoption of 60 credits per academic year (1 credit is equivalent to 1/60 of real work for the complete course). The estimated value of the student's work on a full-time basis (40 hours a week, for 40 weeks) is equivalent to approximately 1600 hours per university course, and therefore an average of 25-26 hours of work per credit.

In order to comply with European directives, the new Spanish credit is defined as *the unit of valuation of academic activity, consisting of a harmonious combination of theoretical and practical teaching, other directed academic activities and the personal work done by the student, so enabling the total volume of work that the student must undertake to pass each subject to be measured.*

This convergence is not considered to be particularly problematic. In fact, the higher education system in Spain (described above) is already a system of accumulation and may be viewed as a reference point for institutions from other countries which aim to produce systems of integrated and differential accumulation for compulsory and optional subjects.

One of the main aims of the pilot project known as "*Tuning Educational Structures in Europe*" is to produce a method or tool in order to measure the workload of students. This project was designed by the *University of Deusto* in Spain in coordination with the *University of Groninger* in The Netherlands, and numerous universities from all over Europe have taken part in it.

The project also aims to obtain a high level of convergence in higher education, with an initial focus on five disciplines: Mathematics, Geology, Economics, Education and History. A Spanish university is designated for each of these areas, and will be responsible for making contacts with other Spanish universities in the same areas and so create forums of debate and discussion which will spread at a European level.

The pilot universities in Spain are: *Autonomous University of Madrid (Mathematics); University of Barcelona (Geology); University of Salamanca (Economics); University of Deusto (Education); University of Valencia (History).*

The project is creating an authentic platform for discussion between universities and the professional sectors, identifying the different professional profiles for each area as well as a series of general abilities, knowledge and specific skills for the five selected disciplines. The results will allow for a model of convergence for each study plan (curricula), which, will permit mutual recognition, and the integration of diplomas in Europe.

One of the basic factors of the program seems to be the common understanding of a system, which allows the workload of a student to be measured, given that ECTS has never designed a tool or methodology, which allows itself to be measured. Work also focuses on finding tools to measure workloads in Distance Learning and Life-long Learning, always depending upon prior identification of the abilities, personal attitudes and skills needed to carry out a certain profession.

4. Course Acknowledgement Parameters

4.1 Rationale for Questionnaire

From the investigations regarding the use of credit point systems like ECTS in course acknowledgement, it had become clear that credit points are a necessary part of transfer as a means of a common currency. However, credit points alone are not sufficient for course acknowledgement.

Consequently, it was necessary to find out on which additional parameters decisions regarding course acknowledgement are based, with the goal to include these parameters into the CUBER metadata model. Furthermore, it was necessary to find out the rules according to which the above mentioned parameters are used to come to a decision about acknowledgement. Extracting the rules enables to come to a conclusion, to what extent the acknowledgement procedure can be automated within CUBER. Extracting the rules also includes extracting the values or value spaces of the parameters used in the acknowledgement process.

We concentrated on the general setting of degree-programs, as the question of acknowledgement is normally handled quite liberally in non-degree programs. Within a degree-program offered by any of the CUBER partners, we first considered the case that a particular mandatory course A from that program is to be substituted by a course B from another provider.

There are several possible reasons for a prospective student to question the CUBER system about the possibility of such a substitution:

- it may be that the course A is not offered in the time-span that the student has in mind;
- it may be that the course B is in a language that the student finds easier to comprehend than course A's language;
- it may be that the course B, although covering the same subject, differs in some details that seem attractive to the student.

In such a situation, the CUBER system should be able to give an answer whether this substitution is possible. However, this can only be decided if it is clear whether the program provider will acknowledge course B as a substitute for its own course A.

Secondly, we considered the scenario where the course A is not mandatory but where it is part of a catalogue consisting of n courses, from which $m < n$ courses must be successfully completed in the course of the program. This situation gives of course more degrees of freedom with regard to acknowledgement than the situation of a mandatory course A.

Third, we considered the scenario where not a single course B is requested as a substitute by the student, but where multiple courses B_1, \dots, B_k are chosen to substitute courses from the catalogue.

The reason to treat these three scenarios separately was not that we expected different sets of parameters guiding the decisions, but that we expected different sets of rules.

The method of choice for revealing the parameters and the rules was to send out a questionnaire that explained the different scenarios and asked to describe the local situation. The questionnaire was distributed to all CUBER partner sites. In case where a partner site was a network, such as EUROPACE and EADTU, the representants were asked to distribute the questionnaire among the institutions they represent.

While such a procedure will surely not derive the most general solution, it will cover the situation within the CUBER partners, which are the sole course metadata providers for the moment. Moreover, as the CUBER partner sites are not to be considered exotic with respect to their institutional status as institutions of tertiary higher education, the set of parameters and rules derived from their situations will likely cover the situations in many other university type institutions.

In so far, the model of course acknowledgement to be derived is scalable with respect to the provider base. Its scalability with respect to the user base, i.e. its ability to acknowledge courses already successfully completed with providers outside the CUBER system, will be investigated in tasks 9.4 and 9.5.

4.2 Example Situations

In order to receive answers that are comparable, we decided to formulate the questions with respect to parameters and rules with the help of examples. Possible answers were yes or no together with a list of differences between the example and the local situation of the person filling the questionnaire. The examples were partly derived from the situation in Hagen. Partly they were also derived from the discussion at the Barcelona meeting. The examples, example parameters and example rules, which will serve as a starting point for the model to be derived, will be explained below. They were chosen as starting points because they reflect the current practice in some institutions, so that it is likely that they also cover others.

In addition to the parameters and rules, the questionnaire also asked for responsibility issues, i.e. who is, in which case, responsible for the decision about course acknowledgement. This will be both interesting (from an academic point of view) and a relevant issue in practice, as most likely the persons or committees responsible for acknowledgement decision will be - in some form - involved in the final setting of parameter values.

For the simple situation of substituting one particular mandatory course A by another course B, we consider the procedure where the courses are compared with respect to their content, extent, difficulty, and examination method. The rule is that course A can be substituted by course B if all comparisons are successful.

The reason to compare for content is pretty obvious. A mandatory course covers an important topic within the programme and thus may only be substituted by a another course that covers the same topic.

As course content already is covered in the course metadata, the relevant parameter is here the amount of overlap that is required to consider two courses exchangeable. The relevant parameter value is here the actual percentage that is taken.

The reason to compare for extent is also obvious. The content comparison can provide information about the number of subtopics that are treated in both courses, but does not reveal too much about the level of detail in which these subtopics are treated. Hence, if the extent of course B is much smaller than the extent of course A, then the level of detail in course B will be less than in course A. The extent of a course is already covered in the course metadata as the number of ECTS credit points earned with successful completion of a course. The relevant parameter is here the amount of difference in extent between A and B that is tolerable to consider the courses exchangeable. The relevant parameter value is the actual percentage of course A's extent that course B must have at least. Of course, if course B earns more credit points than course A, it shall be considered a valid substitute for course A.

The reason to compare for difficulty is less obvious. However, as the workshop on credit point systems revealed, the issue of difficulty is one of the major drawbacks of the ECTS system. It is the reason why it evolved to a set of bilateral links between institutions and has not yet become a general european currency of education. While the credit points earned specify the amount of effort taken by the student, they say nothing about the academic level of the institution granting the credit points, and they say nothing about the placement of that course within a programme: was it a freshman course, or was it an advanced course? Therefore, acknowledgement has largely remained a manual duty within departments. While the question of academic level plays only a minor role between the CUBER partners, where all participating universities are considered to achieve a level of academic skill required by universities, the issue of placement within a programme still plays a role.

As part of the preparatory action before the actual start of the Workpackage, the notion of difficulty has been incorporated within the course metadata model. Hence, the relevant parameter is here, how many levels of difficulty less than course A's difficulty are allowed for course B's difficulty in order to consider B a substitute for course A. The parameter value is the actual number of levels.

The comparison for examination method is mostly necessary because some university systems - such as the german one for example - differ from the american style examination system where for each course, there are two written tests (midterm and final) that have to be passed. Other types of examination methods are:

- presence: the course is considered successfully completed if the student was present often enough during class hours.
- assignment: the course is considered successfully completed if the student has achieved enough points in the assignments.
- oram exam: after the end of the course, there are oral examinations.

This list is not necessarily complete but reflects the situation in the participating institutions.

As part of the preparatory action before the actual start of the Workpackage, the notion of examination method has been incorporated in the course metadata model. Hence, the relevant parameter is here, which examination methods besides the standard one required for course A are allowed for course B to consider it a valid substitute for course A. The actual parameter value is the list of alternative examination methods, differentiated for each standard examination method.

For the situation where a course A from a catalogue of n courses (typically: a package), from which $m < n$ must be successfully completed, is to be substituted by course B, three different rules are suggested. Most of the rules somehow refer to the mandatory-course situation. Hence, the parameters needed are the same in both situations.

a) "no double use":

This rule comes in two flavours:

a1) course B can have an arbitrary content as long as it is different from the content of the other $m-1$ courses required.

a2) In addition to a1), the content of course B must fit into the subject of the catalogue.

For both flavors, the restrictions concerning extent, difficulty level, and examination method apply.

Rule a1) is the most liberal regulation possible for course acknowledgement. It allows to replace course A by an arbitrary course, e.g. a course in computer engineering can be substituted by a course in philosophy. The only restriction is that the same topic shall not be counted twice, which is a rather obvious requirement. Rule a2) restricts course B's content within the subject of a catalogue. E.g. a course in digital design, out of the computer engineering catalogue, may be substituted by any computer engineering course, but not by a philosophy course. The additional restriction can be understood by the intention of such catalogues: they serve to ensure that a particular subject is covered in the program, but give the student the freedom to choose which topics within the subject are covered.

The relevant parameter here is again based on the course content metadata. For Rule a1) it is the amount of difference in content that is required between course B and each of the $m-1$ other courses in the catalogue to be taken. The parameter value is the actual percentage. For rule a2) it is additionally the amount of overlap between course B's content and the catalogue's content. As long as the catalogue is realized as a package, then the same parameter and parameter value as in the mandatory course situation can be used.

b) "union":

In addition to rule a2), course B's content must now sufficiently overlap with the union of the contents of the n courses in the catalogue.

Rule b) reflects the situation where course B must not only be part of the catalogue's subject, but also cover topics that are also present in the courses offered by the catalogue provider. A reason for this situation is that the package containing the catalogue forms the basis for another package, hence the concrete instantiation of the package is not to be changed.

The relevant parameter here is the same as in the mandatory-course situation.

c) "one-by-one":

Course B's content must match the content of a particular course A from the catalogue, and A is not to be among the other $m-1$ courses taken from the catalogue.

Rule c) is the most restrictive one. A reason to use it might be simplicity of implementation.

The relevant parameter here is the same as in the mandatory-course situation. In fact, we have here an n -fold replication of the mandatory-course situation.

For the situation, that several courses $B_1...B_k$ are to be used to substitute courses from a catalogue, the same rules as before are presented, with the understanding that the courses $B_1...B_k$ are investigated one by one.

4.3 Questionnaire distribution

A first version of the questionnaire was developed and distributed among Workpackage9 partners by mid of May. At the Barcelona meeting, the questionnaire was evaluated based on sample answers received. As a result, it was extended, supplemented by examples, and overall revised.

The revised questionnaire was distributed around Mid June. Until mid August, answers were received from all Workpackage 9 partners and from all other CUBER partners except CNED, which according to Dr. Ferber, seems to be a general problem as a consequence of different readings of the amendment.

Note that the revised questionnaire contains one question that is not used in the current evaluation but which was asked now because it would not make sense to send a separate questionnaire for it. We mean the question of presenting a degree. While the departments' answers will be identical for both the cases where a course B is still be taken and where a course B already has been taken (see tasks 9.4 and 9.5), the case where a degree is presented for acknowledgement will normally only happen when the degree is already obtained (or is about to be obtained).

5. Questionnaire Evaluation and Conclusions

The following are the results of the evaluation of all answers that were received. Moreover, we draw some conclusions about the further work in Workpackage 9.

We first present our findings as a set of theses:

1. Although the departments and their settings for course acknowledgment are quite diverse, mostly the procedure from the questionnaire (question 5) is followed in the mandatory-course situation.
2. As a consequence, the current course metadata scheme need not be changed.
3. The decisions are mostly not based on explicit parameter values. Consequently, the current procedures cannot be formalized and automated "as is". However, an approximation can be automated which gives a good guess.
4. The catalogue-situation is handled quite differently, but mostly based on the example rules given in the questionnaire. This means that - based on the mandatory-course situation - the catalogue situation can be automated, but that several rules would have to be implemented.
5. As the CUBER system is not a degree-granting authority, the system's decision must be supported by a formal decision of the degree-granting institution. Hence, the outcome that an automated acknowledgement by CUBER can only provide a guess of this decision is no severe restriction.

We will detail the theses in the following.

Ad thesis 1:

In the different departments, all kinds of groups are involved in course acknowledgement. Often, the responsibilities are quite distributed as instructors and professors offering a particular course are involved in acknowledgement. Hence, there is no hope to derive a consistent set of parameter values, even if all parameter values were explicit.

Ad thesis 2:

From today's perspective, it was the right decision to have a set of preparatory actions to influence the metadata scheme as early as possible and restrict the late changes to a minimum. That no late changes are necessary at all fills us with particular joy.

Ad thesis 3:

The decisions mostly are not based on explicit parameter values but are more done in a soft, experience-based, and case-by-case manner. Hence, the parameter values are not only not explicit, but there is often not even an implicit parameter value. This means that to achieve semi-automation, a set of parameter values has to be used that matches the reality as closely as possible.

Values discussed are
75% for content match,
80% for extent,

one level less for difficulty.

For examination methods, no final proposal has been found so far.

It is clear that the result of such a comparison is a guess of what the department's decision would have been. However, this is not a severe restriction, see thesis 5.

Partly, there are lists of frequently occurring cases and equivalence matrices, which avoid doing an (automated or manual) comparison altogether for a great fraction of the cases to be handled. These decisions are also fixed, they are much more than a guess.

Ad thesis 4:

While all rules are somehow related, the question is how of them should be implemented. Rules a1, a2, and c were the most frequently cited. Hence, in order to cover at least a considerable part of the participating sites, at least these should be implemented. The implementation overhead for rules a1 and c, compared to the rule for the mandatory-course situation, is also very small. As such, the only rule that would require some implementation effort in the search engine would be rule a2.

An alternative could be that the departments using other strategies are questioned whether a guess based on one of the implemented strategies would be sufficient for them.

Ad thesis 5:

While the student obviously wishes a definite answer to its question about the exchange of courses, the CUBER system cannot give guarantees in this respect. The ultimate responsibility for such a decision rests on the department offering the program. Hence, it must be clear that the CUBER system can only offer a guess, no matter how this guess is computed internally. Under this perspective, it is not a serious restriction that no exact comparisons can be made.

However, considering user satisfaction, the guess derived by the CUBER system must quite closely match the departmental reality concerning decisions of acknowledgement. Otherwise, the advice of CUBER becomes meaningless.

In this respect, the solution found seems to be a good compromise.

6. Web resources

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General Information at www.cuber.net

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<http://www.cuber.net/web/publications/cuber-d8-6.pdf>

ECTS users guide and application forms, 1998, European Commission
<http://www.europa.eu.int/comm/education/socrates/ects.html>

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5. Conference International Seminari Leira, Portugal .November 2000.
6. Conference Report. International Seminari Leira, Portugal (November 2000).
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15. <http://www.seui.mec.es/>
16. Joint declaration of the European Ministers of Education convened in Bologna on the 19th of June 1999
17. Knudsen I, Kirstein J. Trends in Learning Structures in Higher Education. 7 June 1999.
18. López J. Paganni R. Consideraciones generales en la convergencia europea del sistema de enseñanza superior español septiembre 2000.
19. Lourtie.P. The follow-up of the Bologna Declaration. 2000.

20. Lourtie.P.The issue of credit accumulation and transfer systems and the Bologna Declaration. Leiria, 24 November 2000.
21. Machado dos Santos S. Introduction to the Theme of Transnational Education. November 2000.
22. Report “Trends in Learning Structures in Higher Education” (II). Guy Haug and Cristian Tauch (April 2001).
23. Report “Trends in Learning Structures in Higher Education”. Guy Haug and J. Kirstein (August 1999).
24. Report for the European Commission. ECTS extension feasibility project (January 2000), Stephen Adam (University of Westminster), Volker Gemlich (Fachhochschule Osnabrück).
25. Report Trends in Learning Structures in Higher Education. Inge Knudsen Jette Kirstein (7 June 1999).
26. The Unesco/council of Europe Code of good practice in the provision of transnational education. Strasbourg/Bucureşti, 8 January 2001
27. User’s Guide . European Commission (1998).

Annex 1

Questionnaire -- Course Acknowledgement, Revised Version

Consider the following scenario:

A Student who is enrolled in a degree-programme in your department or school, wishes to substitute a mandatory course A of that programme by a course B from a different institution. (I do not distinguish here between a course B that the student already took, and a course B that the student plans to take at another institution.)

01. Institution: FernUniversität Hagen, Germany

02. Department/School: Informatik (Computer Science)

03. Who (Person/Office) is responsible for acknowledgement of courses?

Prüfungsausschuss (Committee of Examinations), the faculty member offering the course under consideration is involved, i.e. a mix between centralized and distributed responsibilities.

04. Is this acknowledgement (responsibility, procedure) regulated by law or is it regulated by your institution/department/school?

- law
 institution regulation

Comments: law defines general rules (equivalence), local regulations refine what equivalence means.

05. What does the procedure look like?

(example: if course B

- is from a recognized institution, and
- has a context (e.g. undergraduate, graduate, postgraduate) not lower than course A, and
- covers content of course A to at least x percent, and
- means a workload (credit points) not less than course A, and
- has an examination method similar to course A (or at least of a certain "strength")

then course B can be acknowledged and course A can be substituted by B.)

- like example
 other:

06. Is the procedure from question 05 explicitly specified or implicitly given by the routine of the person from question 03?

- explicitly ---> question 07
 implicitly ---> question 09

07. If the procedure in question 05 is specified explicitly, are the parameters (like x percent in the example) explicitly specified or are they implicitly taken into account by the experience of the Person from question 03?

- explicitly ---> question 08
 implicitly ---> question 09

08. If the parameters in question 07 are specified, what are their values?

parameter: value:
parameter: value:
parameter: value:
parameter: value:

09. How are the actual values of the comparison (like actual percentage of overlap) derived, manually or semi-automatically?

- manually
 semi-automatically
Comments:

10. Does your institution have lists of decisions on frequently occurring cases?

- yes
 no

Now consider the following varied scenario:

Course A to be substituted is not mandatory but from a set of n courses of which $m < n$ must be taken. Three strategies are considered:

a) no double-use:

- a1) course B can have arbitrary content as long as it is different from the content of the other m-1 courses to be taken.
a2) course B can have arbitrary content within the subject of the catalogue, as long as it is different from the content of the other m-1 courses to be taken.

b) union:

course B's content must match the union of the contents of the courses from the catalogue to at least x %, and B's content must be different from the content of the other m-1 courses to be taken.

c) one-by-one:

course B's content must match the content of one particular course A from the catalogue to at least x%, and A must not be taken as one of the other m-1 courses.

11. Which of the strategies are followed at your institution:

- a1
- a2
- b
- c
- other:

Comments:

12. Does the procedure from question 05 and/or responsibility from question 03 change in other aspects if the varied scenario is considered?

- Yes:
- NO

13. Are there more differences if several courses B_1, \dots, B_k are to replace courses from the catalogue in the varied scenario?

- Yes: many-to-one is possible, i.e. several smaller courses can replace one larger course
- NO

14. What is the procedure to handle cases where a degree is presented to substitute a course A?

- The degree is given as the list of courses leading to this degree and the procedure from question 12 is followed.
- There is a matrix which courses are covered by which degree
- other:

Comments: A mix strategy is applied, to ensure that the procedure is chosen which is more advantageous for the student.

Annex 2

Questionnaire -- Course Acknowledgement, Revised Version

Consider the following scenario:

A Student who is enrolled in a degree-programme in your department or school, wishes to substitute a mandatory course A of that programme by a course B from a different institution. (I do not distinguish here between a course B that the student already took, and a course B that the student plans to take at another institution.)

01. Institution: University of Helsinki

02. Department/School: Palmenia Centre for Research and Continuing Education

03. Who (Person/Office) is responsible for acknowledgement of courses?

First a notice:

Actually, being an open university Palmenia does not give degrees and thus course acknowledgement is not such an important issue. (Usually OUR courses are being acknowledged by universities and faculties.)

On the other hand, University of Helsinki has 9 faculties and 15 institutions (including Palmenia) in it, and they all have differing conventions for course acknowledgement. However, some general guidelines can be found.

NB! In question 10. the answer is on behalf of Palmenia, not the whole UH.

03. Some faculties/institutions have International affairs' offices where people have more experience and responsibility on course acknowledgement. The final decision is to be made by the professor/lecturer teaching and individual course.

04. Is this acknowledgement (responsibility, procedure) regulated by law or is it regulated by your institution/department/school?

law

institution regulation

Comments: There is no law regulating this, but most Finnish higher education institutions follow the same conventions and similar regulations (UH among them).

05. What does the procedure look like?

(example: if course B

- is from a recognized institution, and
- has a context (e.g. undergraduate, graduate, postgraduate) not lower than course A, and
- covers content of course A to at least x percent, and
- means a workload (credit points) not less than course A, and
- has an examination method similar to course A (or at least of a certain "strength")

then course B can be acknowledged and course A can be substituted by B.)

like example

other: Sometimes only the first requirement counts, sometimes there are more, e.g. concerning the material used. This depends most on the course A and its professor/lecturer! The first requirement (recognized institution) can be considered the only compulsory requirement.

NB! I wish to answer question 8, though these considerations are more implicit and varying (common conventions), and by no means a strict rule.

06. Is the procedure from question 05 explicitly specified or implicitly given by the routine of the person from question 03?

explicitly ---> question 07

implicitly ---> question 09

07. If the procedure in question 05 is specified explicitly, are the parameters (like x percent in the example) explicitly specified or are they implicitly taken into account by the experience of the Person from question 03?

explicitly ---> question 08

implicitly ---> question 09

08. If the parameters in question 07 are specified, what are their values?

parameter: recognized institution value: a must

parameter: workload value: 40-50%

parameter: content and coverage value: 30-50%

parameter: other (assessment method/material used/etc.) value: 0-30%

09. How are the actual values of the comparison (like actual percentage of overlap) derived, manually or semi-automatically?

manually

semi-automatically

Comments:

10. Does your institution have lists of decisions on frequently occurring cases?

yes

no

Now consider the following varied scenario:

Course A to be substituted is not mandatory but from a set of n courses of which $m < n$ must be taken. Three strategies are considered :

- a) no double-use:
- a1) course B can have arbitrary content as long as it is different from the content of the other m-1 courses to be taken.
 - a2) course B can have arbitrary content within the subject of the catalogue, as long as it is different from the content of the other m-1 courses to be taken.
- b) union:
course B's content must match the union of the contents of the courses from the catalogue to at least x %, and B's content must be different from the content of the other m-1 courses to be taken.
- c) one-by-one:
course B's content must match the content of one particular course A from the catalogue to at least x%, and A must not be taken as one of the other m-1 courses.

11. Which of the strategies are followed at your institution:

- a1
 a2
 b
 c
 other:

Comments: NB! This is an rough guess of common conventions in UH.

12. Does the procedure from question 05 and/or responsibility from question 03 change in other aspects if the varied scenario is considered?

- Yes: The responsible person might not be the lecturer of an individual course any longer, but the professor, director, or other "superior". The procedure would be the same.
 NO

13. Are there more differences if several courses B₁,...,B_k are to replace courses from the catalogue in the varied scenario?

- Yes:
 NO

14. What is the procedure to handle cases where a degree is presented to substitute a course A?

- The degree is given as the list of courses leading to this degree and the procedure from question 12 is followed.
 There is a matrix which courses are covered by which degree
 other:

Comments: There is more experience of some degrees (of some institutions/universities), and thus they can be more easily considered as a substitution. The procedure is more detailed and longer, if there is no prior experience of the degree nor the providing institute/university.

Annex 3

Questionnaire -- Course Acknowledgement, Revised Version

Consider the following scenario:

A Student who is enrolled in a degree-programme in your department or school, wishes to substitute a mandatory course A of that programme by a course B from a different institution. (I do not distinguish here between a course B that the student already took, and a course B that the student plans to take at another institution.)

01. Institution: UOC

02. Department/School: UOC

03. Who (Person/Office) is responsible for acknowledgement of courses?

It depends if the acknowledgement is for recognition specify in law or no.

In the first case, the responsible from UOC is Student Support Service

In the second case it is Studies Evaluation and Accreditation Commission. This Commission is composed for the studies directors, the president is the vice-rector in Academic Policy and the secretary is the responsible person in the Previous Learning evaluation process.

04. Is this acknowledgement (responsibility, procedure) regulated by law or is it regulated by your institution/department/school?

law

institution regulation

Comments: Compulsory are regulated by law and the others are regulated by the institution depending on the kind of subject

05. What does the procedure look like?

(example: if course B

- is from a recognized institution, and
- has a context (e.g. undergraduate, graduate, postgraduate) not lower than course A, and
- covers content of course A to at least x percent, and
- means a workload (credit points) not less than course A, and
- has an examination method similar to course A (or at least of a certain "strength")

then course B can be acknowledged and course A can be substituted by B.)

like example

other: This process is followed but only it is recognized if the other institution is an university or high-level school. If so, we don't care if the examination/assessment method is not similar to course A or not.

When the student has already passes a course and he applies for the acknowledgment/recognition there is an agreement, between the two institutions then the validation is automatic.

06. Is the procedure from question 05 explicitly specified or implicitly given by the routine of the person from question 03?

explicitly ---> question 07 Explicitly for students, professors (Commission) and management staff (student Support Service)

implicitly ---> question 09

07. If the procedure in question 05 is specified explicitly, are the parameters (like x percent in the example) explicitly specified or are they implicitly taken into account by the experience of the Person from question 03?

explicitly ---> question 08 . When professors have established equivalence matrix between the programs.

implicitly ---> question 09 . For the rest.

08. If the parameters in question 07 are specified, what are their values?

parameter:	value:
parameter:	value:
parameter:	value:
parameter:	value:

09. How are the actual values of the comparison (like actual percentage of overlap) derived, manually or semi-automatically?

manually

semi-automatically

Comments: if we have some applicants from the same kind of programs and we can establish criteria, then we try to build up a new equivalence matrix.

10. Does your institution have lists of decisions on frequently occurring cases?

yes

no

Now consider the following varied scenario:

Course A to be substituted is not mandatory but from a set of n courses of which $m < n$ must be taken. Three strategies are considered:

a) no double-use:

- a1) course B can have arbitrary content as long as it is different from the content of the other $m-1$ courses to be taken.
- a2) course B can have arbitrary content within the subject of the catalogue, as long as it is different from the content of the other $m-1$ courses to be taken.

b) union:

course B's content must match the union of the contents of the courses from the catalogue to at least $x\%$, and B's content must be different from the content of the other $m-1$ courses to be taken.

c) one-by-one:

course B's content must match the content of one particular course A from the catalogue to at least $x\%$, and A must not be taken as one of the other $m-1$ courses.

11. Which of the strategies are followed at your institution:

a1

a2

b

c

other: Different strategies and criteria are considered depending on each kind of programs.

Comments:

12. Does the procedure from question 05 and/or responsibility from question 03 change in other aspects if the varied scenario is considered?

Yes: It could change, but we can't determine how it changes without analyzing each student situation/files

NO

13. Are there more differences if several courses B_1, \dots, B_k are to replace courses from the catalogue in the varied scenario?

Yes: We can predict more differences, but we can't concrete them before analyzing each student files.

NO

14. What is the procedure to handle cases where a degree is presented to substitute a course A?

- The degree is given as the list of courses leading to this degree and the procedure from question 12 is followed.
- There is a matrix which courses are covered by which degree
- other:

Comments:

Annex 4

Questionnaire -- Course Acknowledgement, Revised Version

Consider the following scenario:

A Student who is enrolled in a degree-programme in your department or school, wishes to substitute a mandatory course A of that programme by a course B from a different institution. (I do not distinguish here between a course B that the student already took, and a course B that the student plans to take at another institution.)

01. Institution: University of Linz

02. Department/School: Technical Faculty

03. Who (Person/Office) is responsible for acknowledgement of courses? Dean of studies

04. Is this acknowledgement (responsibility, procedure) regulated by law or is it regulated by your institution/department/school?

- law
 institution regulation

Comments: case by case

05. What does the procedure look like?

(example: if course B

- is from a recognized institution, and
- has a context (e.g. undergraduate, graduate, postgraduate) not lower than course A, and
- covers content of course A to at least x percent, and
- means a workload (credit points) not less than course A, and
- has an examination method similar to course A (or at least of a certain "strength")

then course B can be acknowledged and course A can be substituted by B.)

- like example
 other:

06. Is the procedure from question 05 explicitly specified or implicitly given by the routine of the person from question 03?

- explicitly ---> question 07
 implicitly ---> question 09

07. If the procedure in question 05 is specified explicitly, are the parameters (like x percent in the example) explicitly specified or are they implicitly taken into account by the experience of the Person from question 03?

- explicitly ---> question 08
 implicitly ---> question 09

08. If the parameters in question 07 are specified, what are their values?

parameter:	value:
parameter:	value:
parameter:	value:
parameter:	value:

09. How are the actual values of the comparison (like actual percentage of overlap) derived, manually or semi-automatically?

- manually
 semi-automatically
 Comments:

10. Does your institution have lists of decisions on frequently occurring cases?

- yes
 no

Now consider the following varied scenario:

Course A to be substituted is not mandatory but from a set of n courses of which $m < n$ must be taken. Three strategies are considered:

a) no double-use:

a1) course B can have arbitrary content as long as it is different from the content of the other m-1 courses to be taken.

a2) course B can have arbitrary content within the subject of the catalogue, as long as it is different from the content of the other m-1 courses to be taken.

b) union:

course B's content must match the union of the contents of the courses from the catalogue to at least x %, and B's content must be different from the content of the other m-1 courses to be taken.

c) one-by-one:

course B's content must match the content of one particular course A from the catalogue to at least x%, and A must not be taken as one of the other m-1 courses.

11. Which of the strategies are followed at your institution:

- a1
- a2
- b
- c
- other:

Comments:

12. Does the procedure from question 05 and/or responsibility from question 03 change in other aspects if the varied scenario is considered?

- Yes:
- NO

13. Are there more differences if several courses B_1, \dots, B_k are to replace courses from the catalogue in the varied scenario?

- Yes:
- NO

14. What is the procedure to handle cases where a degree is presented to substitute a course A?

- The degree is given as the list of courses leading to this degree and the procedure from question 12 is followed.
- There is a matrix which courses are covered by which degree
- other:

Comments:

Annex 5

Questionnaire -- Course Acknowledgement, Revised Version

Consider the following scenario:

A Student who is enrolled in a degree-programme in your department or school, wishes to substitute a mandatory course A of that programme by a course B from a different institution. (I do not distinguish here between a course B that the student already took, and a course B that the student plans to take at another institution.)

01. Institution: SDU-Odense University

02. Department/School: Natural and Technical Sciences Faculty

03. Who (Person/Office) is responsible for acknowledgement of courses? One in each department / responding to the Board of Studies

04. Is this acknowledgement (responsibility, procedure) regulated by law or is it regulated by your institution/department/school?

- law
 institution regulation

Comments: It is a soft procedure, case-by-case

05. What does the procedure look like?

(example: if course B

- is from a recognized institution, and
- has a context (e.g. undergraduate, graduate, postgraduate) not lower than course A, and
- covers content of course A to at least x percent, and
- means a workload (credit points) not less than course A, and
- has an examination method similar to course A (or at least of a certain "strength")

then course B can be acknowledged and course A can be substituted by B.)

- like example
 other:

06. Is the procedure from question 05 explicitly specified or implicitly given by the routine of the person from question 03?

- explicitly ---> question 07
 implicitly ---> question 09

07. If the procedure in question 05 is specified explicitly, are the parameters (like x percent in the example) explicitly specified or are they implicitly taken into account by the experience of the Person from question 03?

- explicitly ---> question 08
 implicitly ---> question 09

08. If the parameters in question 07 are specified, what are their values?

parameter:	value:
parameter:	value:
parameter:	value:
parameter:	value:

09. How are the actual values of the comparison (like actual percentage of overlap) derived, manually or semi-automatically?

- manually
 semi-automatically
 Comments: Discretion of evaluator

10. Does your institution have lists of decisions on frequently occurring cases?

- yes
 no

Now consider the following varied scenario:

Course A to be substituted is not mandatory but from a set of n courses of which $m < n$ must be taken. Three strategies are considered:

a) no double-use:

a1) course B can have arbitrary content as long as it is different from the content of the other m-1 courses to be taken.

a2) course B can have arbitrary content within the subject of the catalogue, as long as it is different from the content of the other m-1 courses to be taken.

b) union:

course B's content must match the union of the contents of the courses from the catalogue to at least x %, and B's content must be different from the content of the other m-1 courses to be taken.

c) one-by-one:

course B's content must match the content of one particular course A from the catalogue to at least x%, and A must not be taken as one of the other m-1 courses.

11. Which of the strategies are followed at your institution:

- a1
- a2
- b
- c
- other:

Comments:

12. Does the procedure from question 05 and/or responsibility from question 03 change in other aspects if the varied scenario is considered?

- Yes:
- NO

13. Are there more differences if several courses B_1,...,B_k are to replace courses from the catalogue in the varied scenario?

- Yes: Depending on the time spent at other institution (must cover a semester equivalent (if course is taken away from home))
- NO

14. What is the procedure to handle cases where a degree is presented to substitute a course A?

- The degree is given as the list of courses leading to this degree and the procedure from question 12 is followed.
- There is a matrix which courses are covered by which degree
- other:

Comments: There is a large degree of flexibility, but generally degrees are offered based on a core syllabus and additional activities such as project work. The degrees are in physics/chemistry combined etc.

Annex 6

Questionnaire -- Course Acknowledgement, Revised Version

Consider the following scenario:

A Student who is enrolled in a degree-programme in your department or school, wishes to substitute a mandatory course A of that programme by a course B from a different institution. (I do not distinguish here between a course B that the student already took, and a course B that the student plans to take at another institution.)

01. Institution: KULeuven

02. Department/School:

03. Who (Person/Office) is responsible for acknowledgement of courses? Chairman of the Examination Board (within each Department or School a Board exists per level of study; it is composed by all staff members teaching in the year that the student follows)

04. Is this acknowledgement (responsibility, procedure) regulated by law or is it regulated by your institution/department/school?

- law
 institution regulation

Comments:

05. What does the procedure look like?

(example: if course B

- is from a recognized institution, and
- has a context (e.g. undergraduate, graduate, postgraduate) not lower than course A, and
- covers content of course A to at least x percent, and
- means a workload (credit points) not less than course A, and
- has an examination method similar to course A (or at least of a certain "strength")

then course B can be acknowledged and course A can be substituted by B.)

- like example
 other:

06. Is the procedure from question 05 explicitly specified or implicitly given by the routine of the person from question 03?

- explicitly ---> question 07
 implicitly ---> question 09

07. If the procedure in question 05 is specified explicitly, are the parameters (like x percent in the example) explicitly specified or are they implicitly taken into account by the experience of the Person from question 03?

- explicitly ---> question 08
 implicitly ---> question 09

08. If the parameters in question 07 are specified, what are their values?

parameter: value:
parameter: value:
parameter: value:
parameter: value:

09. How are the actual values of the comparison (like actual percentage of overlap) derived, manually or semi-automatically?

- manually
 semi-automatically
Comments:

10. Does your institution have lists of decisions on frequently occurring cases?

- yes
 no

Now consider the following varied scenario:

Course A to be substituted is not mandatory but from a set of n courses of which $m < n$ must be taken. Three strategies are considered:

a) no double-use:

- a1) course B can have arbitrary content as long as it is different from the content of the other m-1 courses to be taken.
a2) course B can have arbitrary content within the subject of the catalogue, as long as it is different from the content of the other m-1 courses to be taken.

b) union:

course B's content must match the union of the contents of the courses from the catalogue to at least x %, and B's content must be different from the content of the other m-1 courses to be taken.

c) one-by-one:

course B's content must match the content of one particular course A from the catalogue to at least x%, and A must not be taken as one of the other m-1 courses.

11. Which of the strategies are followed at your institution :

- a1
- a2
- b
- c
- other:

Comments: a decision has to be taken by the Programming Director of the Faculty, after consultation of the Programming Committee (representatives of teaching staff and students)

12. Does the procedure from question 05 and/or responsibility from question 03 change in other aspects if the varied scenario is considered?

- Yes:
- NO

13. Are there more differences if several courses B_1, \dots, B_k are to replace courses from the catalogue in the varied scenario?

- Yes:
- NO

14. What is the procedure to handle cases where a degree is presented to substitute a course A?

- The degree is given as the list of courses leading to this degree and the procedure from question 12 is followed.
- There is a matrix which courses are covered by which degree
- other:

Comments: the student is in this case "released" from studying course A, which is handled through a decision made by the Academic Secretary of the Faculty (eventually after consultation by the Secretary of the Chairman of the relevant Examination Board).