E-learning Portal Integration to the Information System of Constantine the Philosopher University in Nitra, Slovakia

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1. EXECUTIVE SUMMARY

Literature sources show that e-learning implementation at universities is a long and complicated process. This process has to overcome a wide range of internal and external factors. These factors and their correlative interactions are a key factor resulting in absence of generally usable manager handbook which could be used as a guide in e-learning implementation.

1.1. Background

Constantine the Philosopher University in Nitra is the 4th greatest university in Slovakia. It has five faculties. The institutional strategy for e-learning implementation has not been fully implemented, yet. In this paper we have shortly described the first steps of the e-learning implementation strategy at the university which are based on our present knowledge and experience.

1.2. Alternatives

At first, we have focused on common characteristics and comparison of two fundamental approaches in e-learning implementation - Bottom-up and Top-down approach.

Aside from the finally chosen approach it is a matter of common knowledge that a successful e-learning strategy relies on five main elements – people, tools, training, processes and support. For that reason we have described their importance in both approaches.

In the second part of this paper we have focused on the case study at the Constantine the Philosopher University in Nitra. The process of e-learning implementation on the university level should consider regional circumstances and relations. Therefore, we have decided to combine elements from both above mentioned approaches with the only purpose – to broaden the ideas of e-learning to the wider community of teachers and students of our university. We have described the fundamental structure, principles and forms of the university support of the e-learning and stakeholders.

We have described our findings that we had acquired in the processes of integration of e-learning portal into the infrastructure of the university. We introduce our solution from the point of technicality, management and personnel administration, too. We have dealt with the keynotes of the business model of the e-learning at the university and we have provided the strengths and weaknesses of the current solution. The e-learning portal is available at http://edu.ukf.sk.

1.3. Conclusions

It is necessary to see the e-learning implementation as a continuous and iterative process. The points of the entry into this process will vary depending on the institutional context and personal skills of the stakeholders.

2. APPROACHES TO E-LEARNING IMPLEMENTATION

Significant work in e-Learning development have been presented in the literature ranging from case studies, comparison studies, pedagogical aspects and evaluation to monitoring studies. This has resulted in the development of various e-Learning implementation strategies and models (Kahiigi, 2008).

Literature sources show that e-learning implementation at universities is a long and complicated process. This process has to overcome a wide range of internal and external factors. These factors and their correlative interactions are a key factor resulting in absence of generally usable manager handbook which could be used as a guide in e-learning implementation. In either case it is very practical to gain some information and experience from literature.

Aside from the finally chosen strategy it is generally known that a successful e-learning strategy relies on five main elements:

- people,
- tools,
- training,
- processes,
- support.

An understanding of the effect of these elements, combined with a holistic understanding of the place of e-Learning within university, will ensure selection of the best suited strategy for current needs, and will be flexible enough to support the changing needs of the university over time (Brandon, 2007).

In this chapter we will concentrate on above-mentioned elements and characterize basic approaches in e-learning implementation:

- bottom-up approach,
- top-down approach.

2.1. Bottom-up Approach

Bottom-up approach main idea lies in a possibility to build an e-learning system in the university environment by building e-learning courses in sequences and with different qualities, using all functional parts and their gradual integration. In heterogeneous environment, we try to implement clear rules to the diversified system and at the same time keep attention of people who are already using and are interested in e-learning courses in the education process.

Functions of particular elements can be characterized as follows:

People – refers to the various individuals involved in the design and development of e-learning initiatives. Main advantage of this approach of e-learning implementation is an enthusiastic and innovative teacher wanting to improve teaching and responding to student and industry needs (Thompson, 2006).

These people significantly affect all elements. They found their own ways in solving problems connected with e-learning, took initiative and found appropriate tools and environments. They made their own view on e-learning closely connected with their pedagogical and technical capabilities. This fact is their main strength and weakness at the same time.

In bottom-up approach the ideas and enthusiasm of these people are very important. On the other hand, they are not willing to lose their old techniques and favourite tools for building e-learning content. Therefore, it is very important to guide them diplomatically and - unlike people unaware of the problem - motivate them by giving them good reasons for e-learning integration into the university infrastructure.

Tools – Bottom-up approach is characterized by the existence of different tools for building e-learning content. These tools include different desktop applications, authorware available on

Internet as well as the entire LMS. The term e-learning is often understood in its most general meaning. E-learning represents any kind of electronic material available on university web sites, teachers' personal web pages or any free webhosting service web pages.

The final form of educational material and e-learning courses is very varied and reaches different quality levels. The quality level is mostly represented by pedagogical capabilities and computer skills of the author of e-learning material. There are no available templates, recommendation or review for building e-materials.

Heterogeneity of used tools can result in a problem that it will be impossible to share the final products and thus time spent on building the materials as well as human potential will not be used optimally.

Therefore, we must aim to make enough space for discussions about standardization of formal structure and content of created materials.

If we consider using bottom-up implementation of e-learning, we assume that there are several learning management systems at a university. The existence of these systems can be considered as an advantage only if the systems support certain level of content exchange standards, e.g. SCORM, ADL, IMS. If most of the e-learning materials are web sites based or are formed by separate data files, their integration into LMS can be done only after complex modifications.

Training – refers to the learning and knowledge opportunities provided by implementator to address the needs of various individuals involved in the process of e-learning implementation.

In this approach we assume that preparation of stakeholders is not systematic. Individuals taking part in this process benefit from their own experience, discussions with their colleagues or from e-learning conferences and literary sources. They also have a few different roles. They are administrators, courses creators and teachers at the same time.

In the process of implementation we should consider the fact that stakeholders (except for some enthusiasts) participated in some unrelated e-learning trainings. Many times these people did not acquire enough information to understand complexity of e-learning. Very often the content of these workshops is oriented to master some authorware or LMS with integrated tools for building courses. Much less attention is concentrated on e-learning teaching aspects.

This condition is the normal consequence of occasionally and non systematic evolution of e-learning at the university. There is no form of internal or external certification. Introducing teachers to the use of technology and tools of e-learning is not enough.

In bottom-up approach we should concentrate on creating multi-level workshops for stakeholders of different skills. The aim of introductory workshops should be to introduce possibilities of e-learning education, present best-practices positively implemented in the university environment and at the same time introduce actual opportunities for support and cooperation. In this stage, we need to consider if these introductory workshops will be lectured by enthusiasts or experts having enough experience in positive e-learning implementation. The best possible solution will probably be finding suitable lecturers from both mentioned groups supported by enough space for discussions and informal exchange of know-how.

Processes – are the methods and procedures used to execute a successful e-learning implementation. Implementing a successful e-learning solution begins with the provision of a strong methodology that supports how the initiative is designed, developed, and delivered. We need to communicate this methodology clearly so that all stakeholders understand, and adopt it – it is an opportunity to reinforce best practices and highlight roles and responsibilities (Brandon, 2007).

In case of bottom-up approach our effort should point to identification of the best "surviving" outcome. Used methodology should at least in first stages include already reliable techniques. By defining procedures and methods afresh we risk loosing an interest of potential users, course creators and also "e-learning pioneers".

Support – Support has to be understood in two ways. There is university management support on one hand and e-learning community support on the other hand.

The arising e-learning community support is inevitable for organized trainings, workshops and certifications. This support includes technical, contextual and educational aspects. It is very important to have sophisticated system for problem solving with e-learning implementation. This

system should be based on peer-to-peer discussions, one-to-one mentorship and/or an e-learning expert support.

University management support forms the weakest part of bottom-up approach. In a hierarchical structure as the university, new ideas enforce very problematically and require enormous effort. The same applies to e-learning. Bottom-up approach is based on enthusiasm of some people who try to enforce achieved knowledge at higher university level than department level. However, the effort often fails mainly on middle and higher management support.

Despite best intentions and enormous energy, one person cannot by himself shift e-learning from the margins to the mainstream across a hierarchical structure of the university (Thomson, 2007).

Is it possible to get any quality support from management in bottom-up approach e-learning implementation? To a certain level - yes. However, this requires presenting a clear vision substantiated by hard work and systematic work, having the science work results recognized on specialized forum and last but not least by hitting the right moment.

Short summary

After analyzing certain elements of e-learning strategies it is obvious that the success of bottom-up approach of e-learning implementation at a university level is clearly connected with sensitive human resources work, constant motivation, acceptation of importance of this issue at least from a part of university management staff. At the same time, a skill to coordinate different groups and divisions into common goals is very important in this process.

Why are we dealing with this implementation into such details when it is connected with so many obstacles? The reason is the fact that e-learning form of education is very often appearing at the universities in an atomized form. Also, we often meet with effort of an enthusiast to extend classic education method with e-learning.

What is the strength of this approach? The bottom-up approach is suitable for course design in which the users also play a role (Barajas, 2000). Allow academics to add unique elements to a course. This is vital to self-esteem and teaching commitment and enables students to identify with the lecturer's character, personality and pedagogy.

At the end of this chapter we can, however, ascertain that the bottom-up, course-by-course approach to constructing an e-learning at the university is slow, labour intensive and prone to failure (Pollock, N., 2000).

2.2. Top-down Approach

The basic idea of top-down approach is in initializing the implementation of e-learning solutions by the university management. This implementation should be in line with long term vision of the university development.

We can see two basic forms of implementation. The first one is outsourcing whole e-learning solution by an external provider. The second one in using university own resources. In case of outsourcing the process of implementation and particular steps are in provider's hands. We will concentrate on the second form – implementation using our own resources. We will show this approach on the basis of the same elements as in bottom-up approach.

People - the main difference between top-down and bottom-up approach is in different skills of people joining the implementation team. Here we can create the team of specialists from the university departments necessary for the success of implementation right from the beginning. While we are building the team, we should use the knowledge of university environment and know the people who are already using the e-learning in amateur way. Also we have to clearly specify the responsibilities of particular members of our implementation team.

The first step of the management should address making the change understandable to teachers, administrators and students. Even the best ideas can fail if they are not properly understood by the stakeholders. The school management should therefore attract all potential partners and invite them to share their vision and to participate in its implementation (Hvorecký, 2008).

Tools - Tools are the technological resources we will use to conceptualize, design, and develop e-learning solution. Regardless of which tool(s) we end up choosing; we make sure that we take

adequate time to assess our options and determine the best tool for our needs, our users, and the whole organization (Thomson, 2006).

Selection of the LMS (Learning Management System) plays a key role in the success of e-Learning implementation. Even the most well-designed and executed course will have limited effect if it is not effectively managed and delivered to the learner. The size and forecasted growth of the organization, and how it uses e-learning for training and development, will dictate the type of LMS we need to consider (Windeatt, 2002). We can choose among commercial packages on the market and open-source solutions. We should regard many parameters in the LMS selection process, mainly integration into other information systems of the institution, scalability, possibilities of technical support and update, security and so on.

Training - one part of communication strategy should be a well made structure of trainings and certifications taking care of target groups needs. These activities have to cover not only the area of creating e-learning content but also prepare people for new forms and models of education to the same degree. Based on several years of experience we can say that the main problem isn't the choice of LMS but insufficient teacher preparation for managing teaching by e-courses in blended and distance learning forms. (Drlík, 2007)

The accent should be done on developing students' competitiveness and on the ability of the course designer and the instructor to exploit technology efficiently, effectively, and at the right moment (Hvorecký, 2008).

The needs of the stakeholders will change over time, and the certification program won't be able to meet all of these needs. Therefore we need to provide training in small, bite-sized learning chunks, minimizing the time and resources required to support these types of training initiatives (Thomson, 2006).

Processes - One of the biggest advantages of implementation in top-down approach is the possibility of identification of the whole process in advance and defining exact rules and procedures. The success of whole integration process depends on consistency of these rules.

Support - A top-down approach can work if staff is given a valid educational rationale and adequate support. What support is needed?

- Full time technical support.
- Full time instructional designers.
- Course development in-house or course development on demand by the external supplier.
- Just-In-Time support is more effective than general training sessions. Just-In-Time support involves providing training, help or advice to a course team when they need it (i.e. at the point when they are preparing or updating their courses).
- One-to-one mentorship as part of a staff development program.
- A discussion platform for staff to showcase their uses of the system and to ask for help and share tips was reported as helpful by all authors.
- Use the e-learning system itself to run courses for staff. The lecturers should be put "into the learners' seat" as this makes them more reflective about learning and more aware of what they are asking of their students.
- Clear payment model (Windeatt, 2002).

Support is required to ensure that individuals have the knowledge and mechanisms they require when involved in e-learning initiatives. These supports allow individuals to reference processes and procedures, review examples, access templates, and get regular updates on the information they need to execute e-learning effectively (Pollock, 2000).

Short summary

At a common university the implementation of e-learning by top-down approach is as difficult as by bottom-up approach. Common factor of problems is not e-learning itself but the fact that people or the university is not prepared for changes.

If the e-learning is driven strategically in a 'top-down' approach it is only successful when there is cooperation with teaching staff, which need to be involved in the decision-making processes. It is evident that the management support and strategic planning are essential to take e-learning from periphery to mainstream. The e-learning impetus cannot be sustained otherwise (Thompson, 2006).

The management of knowledge within a large traditional institution needs its own model that fosters communication and disseminates information throughout its complex and heterogeneous structure, rather than a business model that may have a hierarchical structure without many mechanisms for communication (Barajas, 2000).

3. CASE STUDY

Constantine the Philosopher University in Nitra is the 4th greatest university in Slovakia. The university consists of five faculties. We shortly describe the e-learning implementation strategy in this chapter.

Our final e-learning implementation approach is based literary sources and our personal experience. We do not say that we have strictly chosen bottom-up or top-down approach. We have come to the same compromise as many others in their case or comparison studies. The process of e-learning implementation on the university level should consider regional circumstances and relations (Klimeš, 2006). Therefore, we have decided to combine elements from both above mentioned approaches with the only purpose – to broaden the ideas of e-learning to the wider community of teachers and students of our university.

3.1. Historical Background

We have witnessed the e-learning boom in Slovakia in recent years. It has been assumed that e-learning brings new approaches and challenges to the educational process, ministers to the whole quality of learning and mainly makes study opportunities more available to other target groups. We could possibly have found a few enthusiasts at every Slovak university. They have launched the first learning management systems (LMS) and e-learning courses by themselves. They have shared their experience at the conferences and specialized workshops. They have competed with e-learning courses aimed to evaluate the level of the present state of e-learning at the universities at competitions. Many interesting projects have been realized in this period.

But e-learning, as a progressive form of distance learning, has not achieved more remarkable position in university education up to the present day. Present unflattering state has had several significant reasons falling within the area of education, legislative, policy, management of universities and human resources management.

We mention another important factor that makes the growth of e-learning form of distance education in Slovakia slower. Usually, the e-learning pursues in the bottom-up direction at the Slovak universities. LMS and e-learning courses are used to being at the level of university departments, occasionally at the faculty level. It tends to the parallel existence of several LMS, differences in the quality of provided learning content, LMS users' disorientation and, last but not least, not optimal finance and control management. These LMS fulfill all the functions at the organization level, but their extension to the university level entails a complex process. Constantine the Philosopher University in Nitra (CPU) has found itself in the same situation.

3.2. Selection of Technology – LMS Moodle

Learning Content (Course) Management Systems (LCMS) are mostly web-based systems that combine the management and administrative functionalities of LMS and CMS to author, approve, publish, and manage learning content. They are developed to facilitate the collaborative creation of content, organization, control and to manage the publication of documents in a centralized environment (Kahiigi, 2008).

Several installations of various LMS, commercial but also distributed under the GNU-GPL license, have been installed and used in various projects at the university. There are significant weaknesses of such implementation at the university:

- scattered administration,
- insufficient updates administration,
- incompatibility,
- very complicated user administration,
- obsolescence of the content.

It turned out over the time that educational platform LMS Moodle is the most suitable solution in recent conditions at the university.

The top-down approach has been chosen at the university in an effort to beware the above-mentioned problems. The new LMS installations for blended and distance learning and on-coming e-learning projects have been created with centralized administration and users' support. The fundamental principles and rules of the university support of the LMS and the course development have been postulated. The e-learning portal is available at http://edu.ukf.sk. Its twin for on-coming e-learning projects is available at http://amos.ukf.sk.

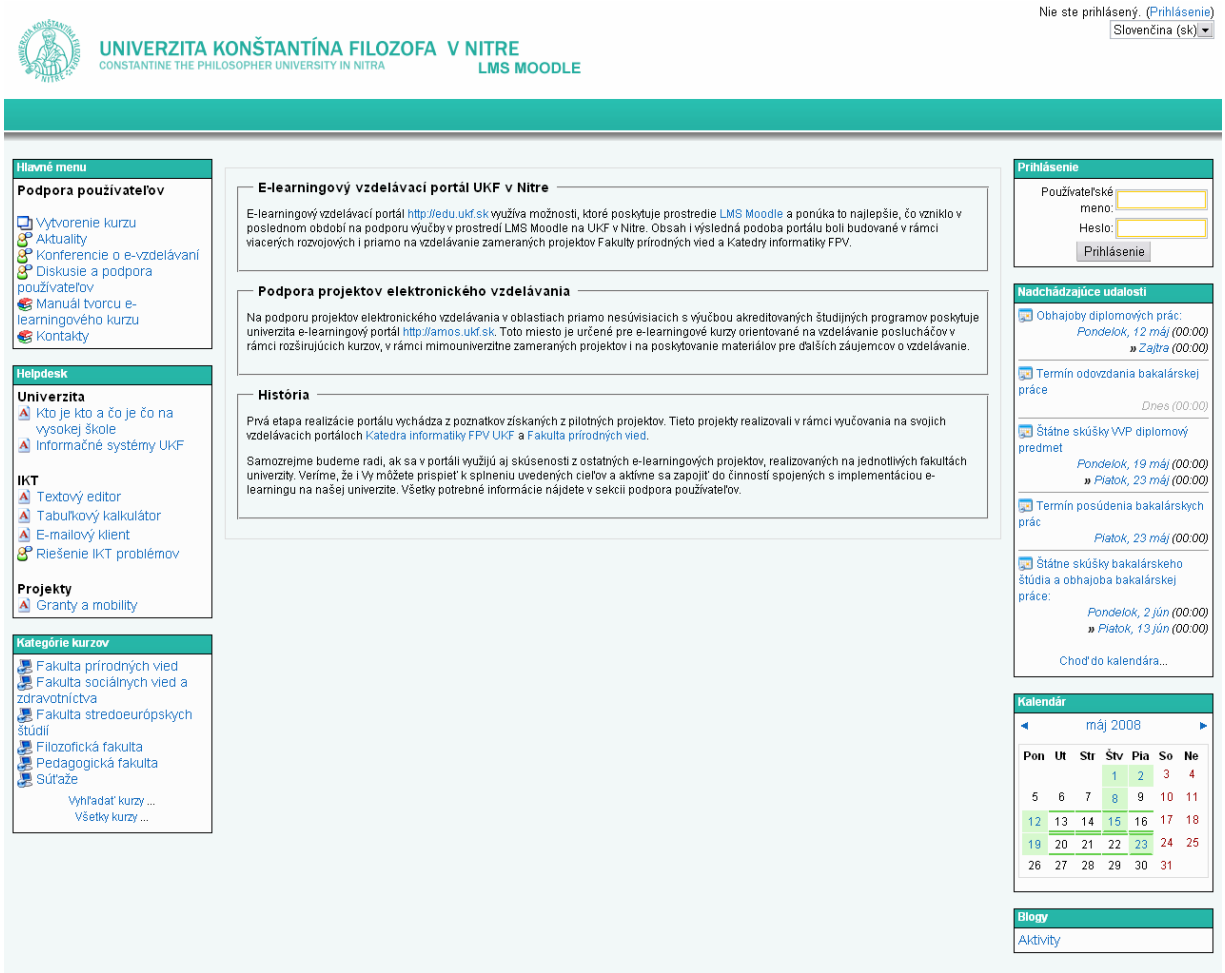

Figure 1: Home page of the e-learning portal of the university

The e-learning portal communicates with LDAP server, which is interconnected with academic information system (students' profiles) and SAP/SOFIA (employees' profiles).

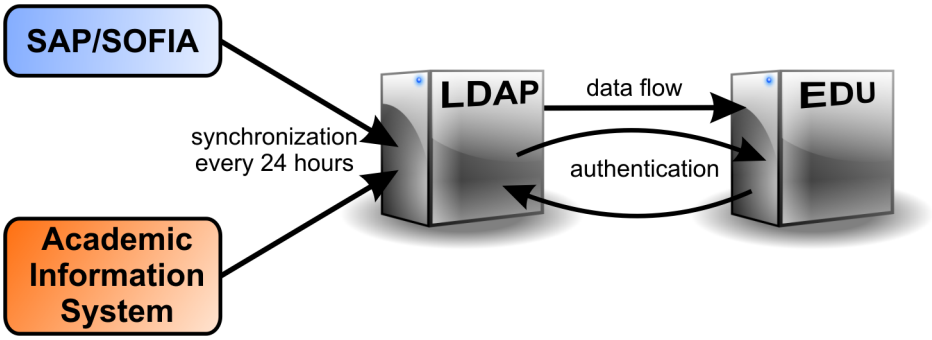

Figure 2: E-learning portal integration to the information systems of the university

Thanks to this interconnection it is not necessary to register portal's users manually. LDAP server serves not only for authentication but also as central data storage for other information systems. It stores detailed information about staff and students, their roles and privileges in various information systems of the university.

This solution assures real and current data continually. In addition, user's account is automatically blocked or revoked after leaving study or termination of employment.

3.3. E-learning Portal Structure and Administration

The objective of the portal is to provide electronic study materials for university study programs. For that reason it is necessary to cover following areas:

- **Hardware and operation system administration** - Centre of Information and Communication Technologies (CICT) of the university rector's office guarantees error-free functionality of hardware and administration of operation system.
- **LMS Moodle administration** - E-learning course creators with the experience in course development and LMS administration (the authors of the paper) assure LMS administration and management. We have decided to choose this solution because of technical services personnel tend to perform their duties based on their technical knowledge, not in pedagogical needs (Barajas, 2000). The additional profit of this solution is close contact between administrators and other e-learning course creators and teachers. The administrators are at once teachers and course creators. They also understand what other portal users (mainly new course creators and teachers) need and what problems they could have. At the same time this solution involves the perspective of further e-learning portal development and improvement. The involvement of such users means that they have much greater interest in self-improvement and portal development than inactive technical personnel of CICT (Drlík, 2007).
- **E-learning Board** – The newly established E-learning Board hides unpractised potential up to now. The E-learning Board should be the consultative advisory authority of the university rector in the field of e-learning activities. The Board should be compound of the representatives of all faculties. Its competency is intended to university coordination of e-learning management, portal and e-learning courses development (Kocur, 2007). The E-learning Board is in charge of administration and evaluation of the formal correctness of created e-learning courses. The layman cannot consider the scholarly content of the e-learning course. The author(s) of the e-learning courses should guarantee the correct content themselves and should obtain objective appreciation.
- **Users support** - We will explain forms of user support in more details in the following chapter.

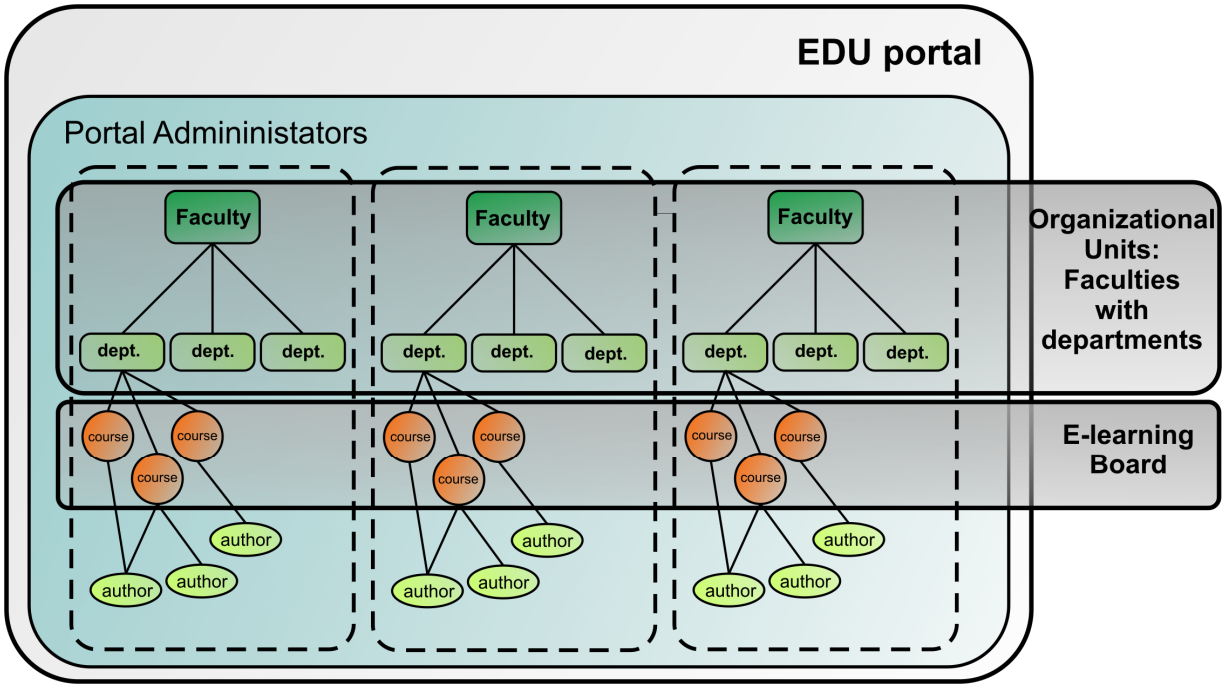

Figure 3: Organization structure of e-learning portal and competencies distribution

3.4. User Support

We understand the user support from several points of view:

- The basic support consists of creating new e-learning course in LMS, its categorization, and roles assignment. The responsible person performs these activities on demand of the applicant at the level of single faculties.
- The support of formal correctness is carried out through course templates. Templates provide the framework for course design and structure (e. g. predefined structure of the lesson or course syllabus). To assist individuals to match to the organization's standards and best practices, it is important to provide templates that can simplify the design and development process, allowing e-learning to be created more efficiently. Templates should be there to support individuals who are new to designing e-learning courses and their content, but not hinder those who have more advanced skills and abilities – therefore the use of the templates should be flexible based on ability (Thomson, 2006).
- We consider building a step-by-step library the reusable learning objects library within the context of the process of e-learning course creation. A learning object is an entity, digital or non-digital, that can be used, reused, or referenced during technology supported learning. Learning objects are created to provide usable content in various disciplines and context, as a result cutting down on production time and cost, enhancing productivity, and improving the quality of learning (Kahiigi, 2008). This idea is very interesting, but we are only at the beginning of the process nowadays.
- The community support rests in moderation of creators' discussions and cooperation in finding solutions of their problems. Portal administrators moderate users' discussions and endeavor to direct their activities.
- Further training of the creators is realized through the electronic materials (lecture notes, books, papers and conference proceedings) and through the workshops and on-the-job trainings.
- Financial support is last, but not least. We are trying to find best-suited and sustainable model for financing the course creators and teachers.

3.5. Business Model

We agree with opinion that initial phase - to purchase and install the technologies and to learn and digitize the material - is costly in terms of time and resources.

Most online courses cost the same or more than traditional courses, but were generally more effective in terms of level of student satisfaction. Development costs were significantly higher than those for traditionally based courses, especially in the development of learning resources (Thomson, L., 2006).

Keeping the portal on high quality level means to create two main categories of courses:

- peer reviewed courses and
- not yet reviewed courses.

This separation can be used also in financial motivation of course creators.

Some Slovak universities have decided to realize single payment per finished course. Considering our actual experiences we recommend to include also other important factors to the financial assessment:

- The primary factor for e-learning course evaluation is the result of reviewing of the scholastic correctness of the e-learning course. The comprehensive course must be appreciated better than incomplete e-learning course.
- E-learning courses are different in content. It is necessary to evaluate the textual and multimedia extent of each e-learning course according to its purpose and aim.
- The number of active teachers in the course – The content of the course may be often created by several teachers. It is important to recognize the overall contribution of each of them. But we should not forget that total difficulty of course creation of one teacher is going down in such a case.
- Teachers' activity and visibility in e-learning course environment represent important aspect of evaluation process. Creating of the e-learning course is only the first evaluative criterion. If course creator (teacher) does not use his/her course in education process, he should not be rewarded again. By contrast, if teacher is regularly visible in the course, moderates discussions and coordinates students' activities, he/she should be remunerated adequately.
- The number of assigned students and their activities are closely associated with teachers' activities. These parameters mirror course attraction and user-friendliness.
- Innovation of the e-learning course rests in the appropriate usage of new, traditional and unconventional methods that increase the overall quality of the educational process. The emphasis should be put on developing students' competitiveness and on the ability of the course designer and the instructor to exploit technology efficiently, effectively, and at the right moment (Hvorecký, 2008). These methods should not go unnoticed.

4. CONCLUSIONS AND RECOMMENDATIONS

E-learning implementation is much more complex and difficult than anyone knew to integrate it into the traditional European university. And a much greater commitment of resources, talent, time, and energy is necessary than anyone knew. Problems have surfaced that may not have been expected, such as significant resistance to changing traditional models and the necessity for ongoing deep strategic needs analysis (Kahiigi, 2008).

It is becoming increasingly clear that there are many reservations, worries, objections and questions about e-learning from the pedagogical, professional, and sociological point of view that must be taken seriously (Barajas, 2000).

It is necessary to see the e-learning implementation as a continuous and iterative process. The points of the entry into the process will vary depending on the institutional context and personal skills of the teacher.

Mentioned approaches will not remain immutable. New circumstances will inevitably arise when alternative and new e-learning tools and techniques will need to be tried and tested, and so a new cycle of development and implementation begins (Thomson, L., 2006).

At the end of our contribution we would say that we associate ourselves with the Barajas's motto:

"There is no invasion possible, nor miracles. The real university world prefers natural, organic evolution."

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