Organizational Design Strategies in Higher Electronic Learning and Teaching Environment

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Summary

New approaches to learning and teaching, introduced by electronic environment are present in higher educational institutions through the world. Still many institutions are either purposely unaware of them or they do not have organizational infrastructure and willingness to fully adopt them. A rigid internal governance structures that is strongly influenced by academic council in most institutions tends to retain status quo. At the same time Laissez-faire approach to development of training materials and adoption of electronic teaching methods tends to increase expenses with no serious results and no dissemination of knowledge that is gathered from those, in most cases, isolated and enthusiastic projects. Advance in technological development is for many institutions just insignificant external factor that only in a way influences their internal organizational change. Still, in the course of this article it will be shown that only strong willingness to adopt full organizational change in the fields of: governance, organizational model, funding and internal culture change, through new vision statement and detailed strategic plan can fully prepare institution for electronic teaching and learning environment. This assertion will be elaborated both from organizational as well as from financial aspect and some best practices solutions and recommendation will be drafted in order to propose concrete change in governance structure, organizational model, funding and internal culture.

Key words: organizational design, e-learning, distance learning, teaching supported by technology

Introduction

Advance in technological development is for many institutions just insignificant external factor that in a way influences their internal organizational change. There are also institutions that are directed towards market and business excellence and at the point when that kind of institution fully recognizes positive ef-

fects of technology they can become strong internal factors that models many key organizational segments such as:

- Employees and a way they are working
- Location and geographical accessibility of resources
- Product (curriculum)
- Tasks and tools used to solve them

In the course of this work analysis of existent referent experiences in organizational change due to introduction of electronic teaching environment in higher educational institutions will be discussed. Also, strategic guidelines will be drafted in order to achieve full implementation of education supported by technology, with decreased spending and organizational problems in the way. As higher educational institutions should be focused on customer (student) rather than on the product (curriculum, materials, technology) the emphasis will be also put on the influence of technology on the learning itself.

Influence of technology on learning

Aforesaid mentioned changes influences significantly the way teaching is conducted in electronic environment. Opposed to teaching that still dominates in most of higher educational institutions, that was in methodological structure imposed in the 19th century by Thomas Huxly and Von Humbolt, new approaches introduced significant comparative advantages as follows;

Increase in learning quality

Quality of learning can be observed from the learning outcomes as well as from the teaching process standpoint. Both standpoints show quality increase. Learning outcomes are positively influenced by the opportunity to use e-learning content and to reuse stored teacher's presentations from the repository of audio/video materials that is available to student at any time and for as long as needed. Quality of teaching process at the other hand can be significantly improved by development and use of interactive video simulations in order to familiarize students with processes and equipment otherwise unavailable to them or by involvement of top of the class international trainers and experts via web conference infrastructure.

Increase in training availability

Today training and learning are indeed lifelong processes that enable individuals to stay current on the labor market. To be able to support that demand, higher educational institutions are in many ways involved in LLL career programs as well as in educational programs for students that are employed. New electronic environment such as e-learning courseware, on demand audio/video materials that were filmed during the lectures as well as on-line interactive

simulations and possibility to access real hardware and software solutions in training purposes via Internet, increases training availability.

Increase in cost effectiveness of education

Investments in electronic training infrastructure and content in order to build quality higher education supported by technology are significant. It is also important to stress out that costs of that kind of training is increased compared to classical training. Still, investments in e-learning and web conferencing infrastructure can increase income due to increases in number of international and distant students to whom the education is now available. It can also cause savings if huge number of students can be trained fully or partly using the technology instead of arranging more classrooms and trainers. Also, possibility to reuse already prepared e-materials by inferior students instead of redoing classroom training for them can cause savings.

Present organizational structures, situation and problems

In higher educational institutions two approaches among teachers can be witnessed; there is a group of enthusiasts who supports introduction of new technologies as a support tools for training and learning. At the other hand resistance to change is also present and is often augmented in the following way: "We have to use technology only for the blind belief that technology is good for us. If we do not accept to use technology in teaching, students will regard us as old-fashioned and will lose their credence in us." (Bates, 2004) Aforesaid opposite attitudes point to the complexity of a problem as well as to the scale of influence technology has on teaching and learning.

Organizational structures in higher education

Organizational structure and governance model in most of the higher educational institutions hasn't changed for centuries and is therefore today almost completely inadequate not only to impose new technologies in teaching but also to underrun any significant enough change. According to (Žugaj, Schatten, 2005) it can best be described as hybrid hierarchical organizational structure that is almost common to old industrial organizations like one imposed in 19th century by Henry Ford. That categorization can be advocated for number of shared elements;

- Work division (different tasks are divided to different groups of workers; teachers do teaching, accountants do accounting, …)
- Hierarchical governance model (depending on the institution's size governance and hence responsibility is cascaded from Rector or Dean down to Faculties or departments)
- Organizational units are formed according to business functions (accounting unit, maintenance unit, …)

- Standardization and high level of bureaucracy is imposed (starting from admission procedure to collegiums definitions all procedures are standardized)
- Economy of scale (huge investments are justified to prepare collegiums in a way that will later reduce delivery costs due to number of enrolled students)

Opposed to pure industrial or post industrial organizational structures, higher educational institutions have specificities which makes them even more rigid and inappropriate for change. They are as fallows;

- Method that is used to develop teaching process and train new teachers is similar as in preindustrial, agricultural society, where farmer was in charge of whole process from sowing to sales of crops. Thus in higher educational institutions teacher is in charge of whole collegium from the design of curriculum up to teaching materials and delivery. The same situation can be witnessed in selection and training of new teachers. As in aforesaid agricultural society teacher in most cases alone picks and trains his successor.
- Governance in higher educational institutions is specific although it slightly differs due to institution's size. In large institutions such as universities Rector is formally in charge but in most cases he or she only controls overall university's budget and some development projects. University components (faculties) are highly independent and are controlled by Deans and most of their decisions have to be supported by academic council of each faculty. That way it is almost impossible to gather all faculties to the same vision and priorities. In such heterogenic and uncoordinated system any decision and specially one to make significant change is either blocked or fades out. In smaller institutions such as colleges and independent Faculties, Dean controls the institution and the budget but academic council is still tough to persuade in support of change.
- Organizational culture in academic institutions as well as value system is specific. Academic independence is almost a dogma which models teacher's mindset in a way that most of the them finds themselves being independent of any but scientific obligations. Even teaching for some of them poses burden since their career path and promotions is far less influenced by teaching quality than by number and quality of scientific work they publish.

In such culture, resistance to change and new technology introduction is to be expected for many reasons. Firstly teachers feel independent to develop their collegiums as they did in the past and as they learned from their mentors. Furthermore being independent and being empowered to influence all strategic institutional decisions through academic council gives solid grounds to support status quo.

Present situation

It can be witnessed that in some institutions there are projects, mostly led by enthusiastic teachers in order to implement some electronic teaching materials and infrastructure. That kind of projects are in most cases either done solely by teachers and his or hers students or are financed by department and in some rare cases faculty or university. Aforesaid Laissez-faire approach dominates as most commonly found model of introducing electronic teaching environment when e-content is concerned. At the other hand computer and networking infrastructure that is mostly used for institution's business functions (collaboration, document sharing …) are much more developed. It is not uncommon for present institutions to even invest in hardware and software that can be used as electronic teaching infrastructure (i.e. "smart" whiteboards, web conferencing infrastructure) but that infrastructure is not in use or is in use only by a small portion of teachers.

Problems

Aforesaid status is formally supported by not having vision and strategic development plan on the institutions level that recognizes need to change and modernize teaching process. Furthermore, in always insufficient funding environment where more trained students for less money is more emphasized each year, courage and envision to start changes can rarely be founded. Laissez-faire approach used to introduce electronic teaching environment is unfortunately in support of that because it increases expenses with little or no results at all. Most of the projects, even if successful, are not promoted and there is no dissemination of knowledge gathered during the project on the institution level. Even bigger problem is poor quality of produced content since one is build by amateurs (teachers and/or students not trained as content developers) and therefore in most cases poorly accepted by students.

Proposed solutions

In order to fully introduce teaching and learning supported by technology institution have to undertake significant change in organizational model, governance structure, organization's culture and funding. Changes of that proportion can be executed only in time and supported by majority of staff. They are much easier to conduct in smaller institutions than in huge universities. To start changes governance has to:

- Share a vision of new era in teaching and learning and also of institution's positioning, primarily to the teachers.
- Prepare vision statement on the level of each department that will represent direction in which teachers and staff from that department see development of the department. After that, first phase, component's (faculty) governance has to gather team that will be populated by representatives of each department in order to prepare faculties' vision statement. Fi-

nally, vision statement on the university level is formulated by a team populated by Deans of each institution that forms university.

- Prepare strategic development plan for the institution that is detailed, founded on the vision statement and that envisage new trends in technology and introduction of electronic teaching and learning environment. To produce strategic development plan that is indeed applicable, many parameters has to be encountered, time and money has to be spent and a team of experts representing each institution or department have to be involved.

At the point when strategic development plan is in place changes are much easier to execute. Firstly because sole process of vision statement and strategic plan production made teachers and other staff more sensible to change and most importantly because decisions that are in line with the plan are no longer to be approved by academic council.

Proposed changes in organizational model

From hybrid industrial model (mixed with agricultural society model) higher educational institutions have to outgrow to modern post industrial model of matrix organization (Žugaj, 2007). That organizational model is represented by:

- High level of specialization and professionalism for key business process. First of all teaching has to be recognized as that kind of process in higher educational institutions. To achieve that, changes in organization's culture that will be elaborated later, have to be executed. In line with that, support teams of experts in teaching as well as in production of e-content and use of e-environment (i.e. web conferencing, "smart" whiteboards, …) will have to be formed (i.e. centre or department for teaching and learning). Those teams will help avert amateurism in content production making investment in content more worthwhile. Furthermore they will gather and disseminate knowledge and expertise in content development at the institutional level. Support team for teaching and design of teaching materials will help teachers learn methodics, didactics and possibly andragogy in order to improve their teaching skills, ones they missed to learn during their formal education. That way even selection and training of new teachers will be more professional and controlled process.
- Introduction of project management approach through the organization that will encourage development projects and that will change organizational model to matrix one. That way each significant enough expense will be observed as a project. Each project proposal will have to first be checked against strategic development plan and approved, upon being submitted to institution's development office. Each project proposal, in order to be eligible, will have to be already approved by department's head or Dean in the case of university prior to submission. Approved projects will be financed from institutions development budget, according

to the planed annual priorities. For each approved project contract will be signed with project leader regulating copyright of materials produced during the project, dedication of project's expenses, division of income if project's deliverables are later commercialized, schedule of milestones and payments, project's scope and due date as well as reporting obligations to institution's project management office (PMO).

Proposed change in governance structure

It is important to appoint person that will be in charge of implementation of technological support to teaching and learning to as high position in governance structure as possible. That person will act as project sponsor for most of the development projects. In the case of smaller institutions (i.e. college) appointment of vice-dean for technological support to teaching or at least vice-dean for development of teaching and learning is strongly proposed. In larger institutions such as university appointment of the vice-chancellor for academic and technological development is a good first step. Still one man can hardly change university so he or she should have up to three deputies; for technology in business, technology as a support tool in teaching and teaching itself. Also, it is recommended to form advisory council for technological support of teaching that consists of; few Deans (department heads in the case of college), representative of centre for teaching and learning, representatives of teachers and person responsible for technology.

Proposed change in organization's culture

Academic community respect's principles and values which are partly opposed to today's dynamic and market oriented trends. That principles and values are outcome of scientific work being almost only relevant parameter in career development and advancement of teachers. To change that culture which partly neglects or at least does not promote quality of teaching, institutions have to change priorities and promote as desirable attitude and manners development and excellence in teaching and learning. That cannot be done only on declarative level or by honourable mentions. Instead it has to be done by adequate scoring of such activities in proceedings of advancement and reappointment of teachers.

Proposed change in funding

Today most of higher educational institutions invest in information technology if not to develop and support teaching then as a means of support to administrational and business activities. Still, despite sometimes millions spent they often do not have clear conception of results that aforesaid investments made (financial nor educational). In order to propose funding strategy that will be in favour of introduction of new teaching and learning supported by electronic technology it is first important to disseminate expenses.

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Production expenses
Are considered to be all expenses that arise during the production of training content or are done to purchase hardware and software equipment required to support that kind of teaching and learning. Those expenses are in most cases relatively high and they pose good grounds to blench from teaching supported by technology.

Variable expenses
Are considered as all expenses that arise in order to deliver teaching to students. They are called variable since their amount will vary due to number of students enrolled. In this kind of expenses one must count teacher's expenses, training premises expenses, expenses of book procurement, etc.

Total expenses
Are sum of production and variable expenses. They are shown in figure 1.

Figure 1: Bearing of total expenses and number of enrolled students
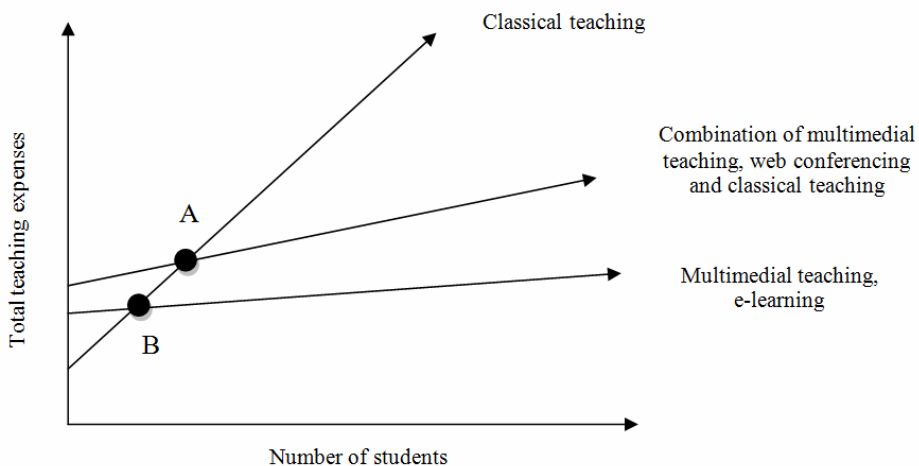
Source: Bates, 2004.

It can be observed in the picture that initial total expense for teaching that is supported by technology is higher compared to classical training, as expected. Also breakeven points A and B show number of enrolled students which, when overcome will yield savings compared to classical training. Point B for pure multimedia teaching and e-learning occurs at lesser number of students while point A occurs for more students. Still, modern trends in higher education advocate combination of multimedia and classical teaching (blended model) that is more expensive to introduce instead of pure multimedia content (Garrison,

Vaughan, 2008). Altogether it can be stressed out that, in order to make savings and to justify expenses in development of teaching supported by technology some minimal number of student have to be enrolled to the module. That number differs on the technique of technology supported training that is used. For the aforesaid reasons institutions should analyse number of enrolled students and other input parameters to decide which for modules (courses) it is feasible to prepare teaching supported by technology.

Origin of funding
In today's world where more trained student are expected for lesser resources each year institutions have to come up with a strategy to introduce technology to their teaching which is in most cases expensive. Proposed strategies are:

- Seek for donations and development project funds financed by state or international donator (i.e. EU Funds such are Tempus, Erasmus…). Be sure to distribute and allocate fund donation in a way that after money is spent project can live alone or financing is continued by institution's resources at least until full results and deliverables are completed.
- Charge newly developed training materials and resources to external students, distant students or ones involved in LLL programs that are using the same materials.
- Redistribution of internal resources in a way that part of the resources are budgeted for development of teaching supported by technology. It is reasonable to budget approx. 5% of total training expenses annually for development projects. (Barr, 2005)
- Centralization of resources can help make savings. It is especially feasible in bigger institutions since most of the faculties maybe already have their support departments and sometimes even departments have some people employed for support. Introduction of service desk concept and also internal invoicing for the services that are delivered to internal customers helps reduce costs and also improve quality. Quality increase is inherent since internal customers do tend to demand quality once they know that even internal services are invoiced to their project or department's budget.
- Strategic alliances can help reduce costs and even improve sales. Institutions that are not market rivals can decide to develop some common courseware that are used in common modules (i.e. basics of mathematics) making significant savings that way. Also, academic institution can make alliance with professional company that offers their services of i.e. courseware production on the market. Being significant strategic client and a reference polygon, higher educational institution can gain better commercial terms and such production expenses will be in most cases lower compared to internal expenses that would institution make working alone.

Conclusion

Introduction of electronic teaching and learning environment in higher educational institutions is inevitable purely because new generation of students already habited to technology in their basic or secondary education and everyday life will hardly be willing to condone higher educational institutions for their life in some other time. Pressure of those students fighting for their careers will require higher educational institutions to be more and more relevant in every aspect. It is almost certain that some of the institutions will not be able and willing to accommodate to aforesaid trends in time, mostly for their rigid organizational structure and ineffective decision making mechanisms. That kind of legging in market driven higher educational systems would possibly strongly influence institution's mere existence.

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