# HOW TO PREPARE STUDENTS FOR PRODUCTIVE AND SATISFYING CAREERS IN THE KNOWLEDGE-BASED ECONOMY: CREATING A MORE EFFICIENT EDUCATIONAL ENVIRONMENT

## Yulia Stukalina

*Transport and Telecommunication Institute,*
*Lomonosova str. 1, LV-1019 Riga, Latvia,*
*e-mail: alina_s@tsi.lv*

**Abstract.** Globalization poses new challenges to higher education institutions. The main concern for educators is to provide their graduates with an extensive assortment of skills required for the new knowledge-based economy. To successfully address the emerging challenges education managers have to create an efficient educational environment for providing a sustaining learning process. The integrated educational environment, where students have an opportunity to develop their creative potential, is an efficient means of preparing students for productive and satisfying careers in the knowledge-based economy. Realizing their strategy educational managers employ a variety of management practices. Integrated management practices accompany pedagogical instruments to be applied in the highly integrated educational environment. The symbiosis of pedagogical and management tools leads to the educational environment enhancement. This paper focuses on some essential educational management issues; it stresses the importance of creating the highly integrated and learner-centred educational environment to provide multidisciplinary education.

**Keywords:** knowledge-based economy, management, multidisciplinary education, educational environment.

## 1. Introduction: new challenges for the educational management in the knowledge-based society

Nowadays, the changes in the international environment are associated with the fast exchange of new ideas and technological innovation. More than ever before, we are counting on innovation and new technologies to drive the growth of the economy, jobs and living standards (Gillespie and Nakatomi 2002). The technological progress leads to new commodities, new markets, and, of course, new knowledge. The economies of the world are increasingly becoming interdependent. The globalization of jobs is an inevitable result of the knowledge-driven economic development - the job market is expanding and becoming global.

The construction of the "knowledge society" is widely recognized as an unparalleled factor in human and social progress, this development being capable of giving people the

competencies they need to face new challenges (Tovar and Castro 2007). Knowledge has always been a valuable and desired commodity, most of the time restricted to the elite (Arora 2005); now it is available to the greatest number of people. As living standards advance, more people realize the importance of improving the level of their education. The significance of continuing education is now vital for the intellectual development of individuals.

It is apparent that technological progress stimulates economic growth; the development of modern society is directly associated with the quality of a country's educational system. Consequently, at the centre of the knowledge-based society is the educational system, on which this society relies. Education is the key resource in today's knowledge-driven society (Schleicher 2003), and knowledge, in its turn, becomes the key resource of production (Drucker 1993).

European educational industry is now in a state of nonstop evolution. Emerging knowledge-based society poses new challenges to traditional educational organizations. In the 21st century, education managers are concerned with the educational environment, which is under the constant influence of the critical globalization trends.

**Table 1.** Essential challenges constituting the strategic context for the educational management

| Global (International) Environment Level | Educational Organisation Environment Level | Educational Management Challenges |
|---|---|---|
| – Rapid technological progress and innovation<br>– Globalization of the manufacturing base<br>– Emergence of the knowledge-based society<br>– Enhanced international cooperation<br>– Increased need to communicate efficiently in the worldwide community<br>– Faster economic growth<br>– Increased competition<br>– Increased government regulation of business<br>– Socio-cultural and demographic changes<br>– Formation of multicultural communities<br>– Increased workforce mobility and customized global job market<br>– Emergence of the idea of sustainable social development<br>– New career opportunities (globalization of jobs, new job growth overseas, new career prospects)<br>– New threats and uncertainties (unemployment, displacement of jobs, polarized work opportunities) | – Increasingly globalized external environment<br>– Emergency of the knowledge-based society<br>– Commoditization of knowledge<br>– Increasing diversification and specialisation of knowledge<br>– New skill development drivers<br>– Rapidly evolving educational environment<br>– Enlarged competition in order to retain and attract talents<br>– Increased demand for higher education in relation to lifelong learning<br>– Increased demand for promoting foreign languages acquisition<br>– Integration of the concepts of sustainability into all levels of education | – Reorganisation of knowledge delivery<br>– Providing new opportunities to students in the context of the job market customization and lifelong learning<br>– Providing computer-based learning to enhance knowledge and to change the way students learn<br>– Providing multidisciplinary education to satisfy the requirements of the knowledge-based economy<br>– Developing a learning environment based on information and communication technologies (ICTs)<br>– Developing and making use of a set of management and pedagogical tools to provide improved knowledge acquisition<br>– Creating resourceful organizational environment to provide a more explorative and creative learning, and ensure students' intellectual and professional growth |

In the extremely globalized international environment, educational organisations must have the ability to investigate the up-and-coming opportunities and threats, in order to provide their students with the access to a broad education.

The author has classified the essential challenges, which constitute the strategic context for the educational management, into 3 groups (Table 1).

In this context, the role of higher education increases considerably. Higher education plays a central role in the creation of a Europe of knowledge. Experts agree that developments in European higher education are moving at an increasing speed (Cooper 2005). To stay competitive European higher education institutions must re-examine their educational strategies. An interdisciplinary approach toward a flexible education paradigm is gaining popularity among educators, since it ensures the necessary evolution of education for coping with the ever-evolving modern society (Gillet and Nguyen Ngoc 2005).

This paper focuses on some essential educational management issues; it stresses the importance of creating the highly integrated and learner-centered educational environment to provide multidisciplinary education.

## 2. Multidisciplinary education

The problematic questions that European educators ask are as follows: "*How good is European education?*", "*How to adapt it to the needs of the knowledge-based society?*", *"How to respond to the globalization of jobs?"*

The global job market needs first-rate professional skills, so we must teach people for more complicated jobs. On the other hand, we have to re-evaluate what professional education is about to add enough value to our students (McGraw 2004). The global job market also demands multidisciplinary skills including good *teamwork skills*. Today, in business and in science, to use multi-functional and intercultural teams to cope with complex problems has become a widespread practice. Business experts state that appointing such a team is frequently the only way to assemble the knowledge and breadth required to pull off many complex tasks the business faces today (Gratton and Erickson 2007). Working in partnerships within teams is also an essential skill, which is highly valued in the economic environment characterized by a dramatic change.

The main concern for education experts is to provide their graduates with a wide variety of skills required for the new knowledge-based economy. Modern society needs professionals who can learn, explore, analyze, design and innovate. Experts point out that "interdisciplinarity is a key to sustaining knowledge-based development (KBD), since any single discipline can be capable of dealing adequately with the complex realities of the knowledge societies" (Carillo 2006). Integrating *interdisciplinary approach* to academic programs can become an efficient means of providing multidisciplinary education.

We assume that one efficient way to provide multidisciplinary education is to apply the *interdisciplinary approach* to learning. This approach is intended to provide the intellectual synthesis. Multidisciplinary programs are characterized by their interdisciplinary model for content and integration of various topics. In such a program, general subjects - social sciences, languages, etc. – are incorporated with specialized subjects (mathematics, physics, computing, management, etc.).

The multidisciplinary program's educational objectives are determined by the strategic and associated objectives of the education and training systems, which were proposed in the work program approved by the "Education" Council and the Commission at the Barcelona European Council Meeting (Official Journal C 142/01 of 14.06.2002). The program's anticipated outcomes are the following:

- ability to use knowledge in practice;
- ability to design and investigate;
- ability to create and innovate;
- ability to manage and compete;
- ability to communicate proficiently in the international community;
- understanding the significance for self-development and life-long learning;
- understanding social, professional and ethical responsibility.

## 3. Efficient educational environment as the basis for learning

The key educational management issues mentioned above demand an efficient educational environment to be considered. To successfully accomplish all complicated tasks, educators have to create an efficient educational environment (EE) as the basis for learning. We presume that multidisciplinary education – an essential feature of modern educational systems - can only be accomplished in the highly integrated educational environment (HIEE), which must be responsive to changes in technology, new developments in pedagogy and management, and the importance of lifelong learning. The integrated educational environment, where students have an opportunity to create and to enhance their creative thinking and their creative potential, is an efficient means of preparing students for productive and satisfying careers in the knowledge-based economy. We need the educational environment with clear connections to the social and global contexts of the profession, which provides a broad education. This new educational environment is determined by the leading tendencies in the global environment.

Modern technology has given rise to new forms of organizations; management has been repeatedly called upon to update its prescriptions in the light of changing environmental conditions (Ford *et al.* 2007). Today, as higher educational institutions continue to evolve and have become large and sophisticated, the role of education managers in developing the most efficient educational environment increases.

Across various organizational units, managerial jobs are different, but at the same time, they all are focused on the educational environment monitoring and developing; this is how management becomes "a team sport that makes similar demands on its players" (Kraut *et al.* 2006). In higher education, effective leadership presupposes having good understanding of how the whole HEI (higher education institution) system works (Spendlove 2007) – this is one of the most important competencies the education managers are supposed to possess.

To be effective and to develop their strategy appropriately education managers must have a clear understanding of their environment, as well as the resources it provides for sustaining the learning process. Thus, first of all we must describe the educational environment subsystems and analyze the relationships between them, as well as the communication scheme within the organization. Since an educational organization is an organ of the society, the analysis of

the society-environment relationships is also essential for developing a manager's strategy. Then we have to provide the system's performance regular evaluation and analysis on the basis of the data collected in the process of the EE assessment.

An educational institution is an open-system organization. It inputs the resources (material resources, information/knowledge) from the external environment, and outputs the result of their operation (skills and competences, i.e. new knowledge) into the external environment. Griffin (1990) characterizes the external environment as the system is comprised of two basic segments: the general environment (composed of "several non-specific components"), and the task environment (composed of "several specific elements of the organization's surroundings: customers, suppliers, partners, etc."). In fact, there is a lot of the general environment aspects that have their impact on the organizational (internal) environment:

- biological environment;
- technological environment;
- economic environment;
- socio-cultural environment;
- political-legal environment, etc.

The general environment can be described as the true reality, in which the educational organization operates; it is beyond the efficient control from the inside. However, education experts have to investigate its influence on the organization's structure and activities in order to provide the analysis of current problems and challenges.

The task environment comprises those job market players who affect the country's educational system and determine the educational organization's operation; in one way or another they participate in the development of the educational policy and in goal-setting: regulators (Ministry of Education), customers (students, employers), competitors (other educational organizations), partners Educational and financial organizations). The impact of the task environment is important because it affects the activities of the organization directly, meanwhile the general environment's influence on the activities of the organization is more indirect.

When the internal educational environment is aligned with the global market needs, it stimulates the organization's performance (Kampas 2004). When the external environment undergoes serious changes, the internal educational environment must modify as well.

**Table 2.** The basic constituents of the internal educational environment

| Material Resources (Material Environment) | Human Resources (Non-Material Environment) | Instructional Environment (Material Environment) |
|---|---|---|
| 1. Physical environment units: buildings, premises including lecture rooms and lecture halls, library, laboratories, canteens, etc., classroom educational equipment<br><br>2. Technological environment: laboratory equipment, computers, organizational internal networks (e. g. intranet, databases)<br><br>3. Financial resources | 1. Managers of all levels<br><br>2. Teachers and instructors (tutors)<br><br>3. Attending staff | 1. Regulative documents, academic programs, curricula, etc., which control the educational process and determine its content<br><br>2. Teaching materials, as an auxiliary tool ensuring the educational process |

**Table 3.** Tangible, semi-tangible and intangible constituents of the internal educational environment

| EE Tangible Constituents | Constituents Associated with Intellectual Capital | Constituents Associated with Learning Process Organization |
|---|---|---|
| – Physical environment units<br>– Financial resources | – Relationship capital<br>– Human capital<br>– Structural capital | – Psychological environment<br>– Executive environment (the activities aimed at knowledge delivery and knowledge construction) |

The internal educational environment in each educational organization is a unique structure, which comprises as material, as non-material (intellectual) constituents. The internal educational environment includes the internal resources of an educational organization intended for sustaining the learning process - that is for knowledge delivery and knowledge creation (Table 2).

We may also classify the internal environment components taking into consideration the embodied intellectual capital – they can be categorized as the EE tangible, semi-tangible and intangible constituents (Table 3).

According to Dawson (2000), *intellectual capital* of the knowledge-based educational organization, which can be categorized as

- *Structural capital*: organizational infrastructure (internal networks);
- *Relationship capital* comprised by relationship with customers, suppliers, partners, regulators, etc.;
- *Human capital*: "the skills and capabilities of people in the organization working individually or in teams".

Intellectual capital is embodied in the internal educational environment in the form of material or non-material resources.

The *psychological environment* is associated with the atmosphere that is created in the process of knowledge delivery and knowledge construction.

The *executive environment* embraces the activities, which are associated with the learning process organization.

## 4. How to provide qualitative changes in the educational environment?

Educational institutions can be considered as knowledge-based organizations, since knowledge is their major resource, knowledge delivery and knowledge creation being their main goal and their basic activity. They provide their students with the opportunity to get professional knowledge and obtain professional skills. Educational managers operate in a complicated educational environment, which includes pedagogical, organizational, managerial, and technological aspects.

Pedagogical aspect includes pedagogical strategies that focus on the learning goals, learning process and learning outcomes. Technological aspect plays a key role in the educational environment based on information and communication technologies.

Managerial aspect involves a set of management practices used by an educational organisation to develop an efficient educational environment capable of providing sustainable

learning process. Management support ensures the coordination and cooperation of the available resources. On the one hand, education managers distribute and use the organizational resources in order to ensure knowledge delivery/acquisition, knowledge sharing and new knowledge construction within the educational environment. On the other hand, they gather the necessary information about the environment (how effectively the resources are engaged, what resources are needed, etc.), process this information and transform it into knowledge. Using the obtained knowledge, education managers work out their strategy for the educational environment evolution. Organisational aspect deals with the relationship between the organisation and its environment; it is based on responding quickly and efficiently to changes in the environment and to the emerging challenges.

The aspects mentioned above are interconnected and mutually dependent. They provide the framework for creating the educational management strategy, which will involve a variety of management tools, as well as a combination of traditional and innovative pedagogical tools.

To be efficient the educational environment must work as a coordinated system; its subsystems should be more integrated and interconnected. If we try to manage these subsystems independently of each other, we will reduce our potential success. The higher integration between the environment components, the more effective the performance of the educational organization, the more capabilities it possesses, and the more learning resources it offers. The integration between the internal environment subsystems is essential to distributing the existing resources to the greatest advantage for all learners with regard to the learning goal orientation.

According to Drucker (1993), the main duty of a manager is to create "a true whole that is larger than the sum of its parts, a productive entity that turns out more than the sum of the resources put into it". This is what we may call *synergy* - the cooperative action of one or more parts, when the whole is greater than the sum of its parts (New Webster's Dictionary of the English Language 1988). To address the main educational management issues we have to synergize the EE resources. In this way, we can ensure the EE integrity and sustainability.

Therefore, education managers should coordinate and distribute all EE resources to guarantee the best result; they have to ensure an appropriate *quality* of the educational environment. To attain the necessary level of the EE synergy, and to provide the best quality of the educational environment education managers have to create the environment distinguished by integrity, manageability, diversity of all subsystems within the entire system, flexibility, ergonomics, and the focus on the learner's requirements. The highly integrated educational environment operates as a well-coordinated flexible *network* based on collaboration. Matching and redistributing the organizational resources within this network managers can adapt their internal educational environment to the changing external environment with constantly developing information technologies and evolving job markets.

As "the value-creating potential of a given network is contained in the sum of resources and capabilities that are pooled by member firms" (Yeo, 2005), so the knowledge-creating potential of the HIEE can be found in *the sum of resources and capabilities*, which are provided by all educational environment subsystems.

The environment that provides the resources integration is conducive to *performance*, and efficient performance is associated with *the qualitative changes* in the educational environment (Fig. 1).

The EE quality improvement presupposes:

1. Increased resources integration.
2. Enhanced performance.
3. ncreased information and knowledge exchange.
4. Improved knowledge delivery, knowledge acquisition and knowledge creation.

Thus, managers of all levels including the administration representatives (senior/strategic management, middle/tactical management, and operational managers), teachers and attending staff work in collaboration and combine their efforts to create an integrated educational environment, which is capable of producing an enhanced knowledge. Maximum effect using minimum resources means successful execution and implementation in a collaborative educational environment.

Thus, harmonizing and redistributing the organizational resources within the network and concentrating their efforts on the EE quality improvement, education managers adjust the internal educational environment to the ever-changing external environment.

From a management perspective, in the process they apply a set of universal management practices: knowledge management, fact-based management (Snowden and Boone, 2007), project-based management, and the rest. Integrated management practices accompany pedagogical strategies to be implemented in the highly integrated educational environment.
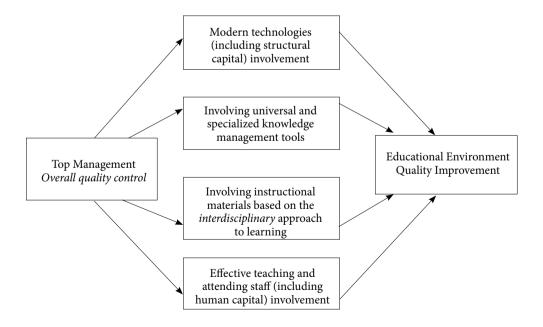


**Fig. 1.** EE Quality improvement scheme

```
┌──────────────────────────┐          ┌──────────────────────────┐
│ Pedagogical instruments  │ ◄──────► │   Management practices   │
└──────────────────────────┘          └──────────────────────────┘
            ▲                                      ▲
             ╲                                    ╱
              ╲         ┌──────────────────────┐ ╱
               ╲──────► │ Integrated EE resources│◄──────
                        └──────────────────────┘
```
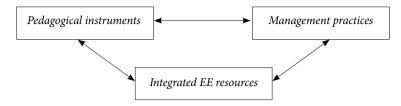
**Fig. 2.** Pedagogical instruments and management practices integration in the HIEE

From a pedagogical perspective, educators can employ a few innovative pedagogical tools, which spring from the knowledge-based economy and are associated with interdisciplinary approach to learning: active (cooperative) learning, technology enhancement, "just-in-time learning", curriculum integration (Taylor *et al.* 2003), as well as project-based learning, distance learning, customized learning packages, etc.

The symbiosis of pedagogical and management tools leads to the educational environment enhancement in terms of

- knowledge (the knowledge environment enhancement);
- resources (the EE resources enrichment);
- the educational environment overall quality.

On the one hand, we use the resources of the HIEE for addressing the most critical educational management issues, and in the process apply a variety of management tools. On the other hand, in the process, we produce new resources and new knowledge, which later can be engaged for enhancing management practices. Thus, the process of realizing educational management strategy possesses a cyclic character (Fig. 2).

## 5. Conclusions

Globalization poses new challenges to higher education institutions. To successfully address the emerging challenges education managers have to create an efficient educational environment for providing a sustaining learning process. Multidisciplinary education - an essential characteristic of modern educational systems - can only be accomplished in the highly integrated educational environment, which is sensitive to changes in technology, new developments in pedagogy and management, and the importance of lifelong learning. The integrated educational environment, where students have an opportunity to develop their creative potential, is an efficient means of preparing students for productive and satisfying careers in the knowledge-based economy.

Educational managers operate in a complicated educational environment, which includes pedagogical, organizational, managerial, and technological aspects. To be efficient the educational environment must work as a coordinated system; its subsystems should be more integrated and interconnected. The integration between the internal subsystems is essential to distributing the educational environment resources to the greatest benefit for all learners with regard to the learning goal orientation. The environment, which provides the resources integration, is conducive to performance. Efficient performance, in turn, is associated with the qualitative changes in the educational environment.

Realizing their strategy educational managers employ a variety of management practices. Integrated management practices accompany pedagogical instruments to be applied in the highly integrated educational environment. This symbiosis of pedagogical and management tools leads to the educational environment enhancement.

## References

Arora, N. 2005. Shaping the information age, in *Connected Workforce*: *Thought Leaders. Essays from Innovators in Business Mobility*, edited by S. Aspinal and A. J. Langer. London: Premium Publishing, 32 –37.

Carillo, F. J. 2006. From transitional to radical knowledge-based development, *Journal of Knowledge Management* 10(5): 3–5.

Cooper, M. 2005. Editorial column, *European Association for International Education Forum* 7(2): 3.

Dawson, R. 2000. Knowledge capabilities as the focus of organizational development and strategy, *Journal of Knowledge Management* 4(4): 320–327.

Drucker, P. F. 1993. *The practice of management.* New York: HarperBusiness.

Ford, E.; Duncan, W. J.; Bedeian, A. G.; Ginter, P. M.; Rousculp, M. D.; Adams, A. M. 2007. Mitigating risks, visible hands, inevitable disasters, and soft variables: Management research that matters to managers, *IEEE Engineering Management Review* 33(1): 85–100.

Gillet, D.; Nguyen Ngoc, A. V. 2005. Collaborative web-based experimentation in flexible engineering education, *IEEE Transactions on Education* 48(4): 696–704.

Gillespie, I.; Nakatomi, T. 2002. Security in the New Economy, *OECD Observer* 231–232: 47–49.

Goerzen, A. 2005. Managing alliance networks: Emerging practices of multinational corporations, *IEEE Engineering Management Review* 33(4): 73–85.

Gratton, L.; Erickson, T. J. 2007. Eight ways to build collaborative teams, *Harvard Business Review* November: 101–109.

Griffin, R. F. 1990. *Management. 3rd ed.* Boston: Houghton Mifflin Company.

Yeo, R. 2005. Problem-based learning: lessons for administrators, educators and learners, *International Journal of Educational Management* 19(7): 541–551.

Kampas, P. J. 2004. Shifting cultural gears in technology-driven industries, *IEEE Engineering Management Review* 32(1): 3–11.

Kraut, A. I.; Pedigo, P. R.; McKenna, D. D.; Dunnette, M. D. 2006. The role of the manager: what's really important in different management jobs, *IEEE Engineering Management Review* 34(2): 49–59.

McGraw, D. 2004. Put It into perspective, *IEEE Engineering Management Review* 33(3): 31–34.

Official Journal C 142/01 of 14.06.2002, *Detailed Work Programme on the Follow-up of the Objectives of Education and Training systems in Europe* Available from Internet: <http://europa.eu/scadplus/leg/en/cha/c11086.htm>.

Schleicher, A. 2003. Progress in education: studying the signs, *OECD Observer* 239: 33–35.

Snowden, D. J.; Boone, M. E. 2007. A leader's framework for decision making, *Harvard Business Review* November: 69–76.

Spendlove, M. 2007. Competencies for effective leadership in higher education, *International Journal of Educational Management* 21(5): 407–417.

Taylor, R. L.; Heer, D.; Fiez, T. S. 2003. Using an integrated platform for learning™ to reinvent engineering education, *IEEE Transactions on Education* 46(4): 409-–419.

Tovar, E.; Castro, M. 2007. Building common spaces in engineering education: a review from ICECE05, *IEEE Transactions on Education* 50(1): 79–84.

## KAIP PARENGTI STUDENTUS SĖKMINGAI IR TEIKIANČIAI PASITENKINIMĄ PROFESINEI VEIKLAI ŽINIŲ EKONOMIKOJE: EFEKTYVESNĖS UGDYMO APLINKOS KŪRIMAS

**J. Stukalina**

Santrauka

Globalizacija kelia naujų iššūkių aukštojo mokslo institucijoms. Dabar pagrindinis pedagogų rūpestis – suteikti būsimiems specialistams kuo daugiau žinių naujosios žinių ekonomikos sąlygomis. Norint sėkmingai priimti kylančius iššūkius, subalansuotam mokymo procesui ugdymo planuotojai turi sukurti efektyvią ugdymo aplinką. Integruota ugdymo programa, suteikiant studentams galimybių tobulinti savo kūrybingumo potencialą, yra veiksminga priemonė, rengiant studentus sėkmingai ir pasitenkinimą teikiančiai profesinei veiklai žinių ekonomikoje. Realizuodami savo strategiją ugdymo planuotojai naudoja daug vadybos technologijų. Vadybos technologijos kartu su pedagoginėmis priemonėmis gali būti pritaikytos integruotoje ugdymo aplinkoje. Pedagoginių ir vadybos priemonių simbiozė gerina ugdymo aplinką. Straipsnyje aptariamos kai kurios svarbiausios ugdymo organizavimo problemos, pabrėžiama integruotos ugdymo aplinkos sukūrimo svarba teikiant daugiadisciplininio ugdymo paslaugas.

**Reikšminiai žodžiai:** žinių ekonomika, vadyba, daugiadisciplininis ugdymas, ugdymo aplinka.

**Yulia STUKALINA.** MSc. Paed., Lecturer, Chair of Linguistics, Transport and Telecommunication Institute (Riga, Latvia). University studies: First degree in foreign languages, Latvian State University, Faculty of Foreign Languages (!987). Master's Degree in Pedagogics (1996). PhD student, Faculty of Education and Psychology, University of Latvia. Research interests: educational management, pedagogics, linguistics.