

From isolated international educational projects towards the unifying concept of the cross-border university

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ABSTRACT: The article outlines an innovative model for a Finnish-Russian educational environment. The proposed structure, called the Cross-Border University (CBU), was designed as the result of the continuous development of the Internationals Masters' Programme in Information Technology (IMPIT), which has been run in several Southeast Finnish and Northwest Russian universities since 1999. The suggestions presented in the article are based on the authors' extensive personal experiences from working with tens of Russians who have studied and graduated from the programme, as well as from the authors' active contacts with the administration of several Russian universities. An inherent part of the CBU solution is to also introduce a specific semi-virtual teaching technology that has been designed with regard to the level of the Russian academic infrastructure.

INTRODUCTION

Globalisation, internationalisation, virtualisation and industrialisation are four terms characterising four complex processes that touch on many areas of life nowadays. Naturally, higher education cannot be excluded from these trends that force single universities to share and exchange resources through international networks and to exercise flexibility when designing educational programmes and services in order to meet the demands of industry. This logically means that the traditional role of *stone universities*, which serve as regional or national educational, research and cultural centres, must be reconsidered and updated in accordance with the changing conditions and technologies. Consequently, new techniques, processes and relationships must be discovered and introduced, as have already been discussed in several recent and thorough studies [1][2].

A literature survey, conducted by the International Association of Universities clearly documents the fact that there needs to be change in focus from purely technological matters and *ad-hoc* solutions to systematic, multilevel frameworks that address issues [3]. Examples of this include the development of new organisational and managerial arrangements, their effective interconnection with existing institutional structures, new services, staff motivation and required reward mechanisms, as well as quality improvement issues [4].

Issues related to all the facets of the practical implementation of internationalisation are of particular interest in regions located close to national borders, where properly designed and managed collaboration could solve numerous everyday problems on both sides of the border. This is also the case in Finland. This country, beyond its rich portfolio of other globally oriented educational activities, is also striving to exploit its unique position between the European Union (EU)

and the Russian Federation. Indeed, Finnish-Russian contacts in educational research, institutional development, student exchange, staff mobility or direct teaching are traditionally intensive and have produced valuable results on many platforms [5][6]. They are undergoing developing in close connection with the EU's educational and development policies [7-9]. They have also been specified in several governmental and regional strategies [10-12]. However, this collaboration is still influenced by several national characteristics particular to the Russian academic sector.

Over the past few years, a basic legal framework has been created for the Russian higher education, which attributes authority and responsibility for education to both the federal level and subjects of the Federation. The distribution of competences between the federal and local level is regulated by the federal law on education. Regional and local authorities have the right to set specific educational standards and requirements for their own territories.

This reform is still being hampered by the continued orientation of the educational system towards the maximisation of resources rather than to the optimisation of their use. From this point of view, the internalisation of the Russian academic domain is a perspective that promises to reach the desirable quality under professional guidance. This is why the systematic utilisation and strengthening of international contacts is one of the key issues in the strategic plans of local universities. During their implementation, the following areas must be considered and the related appropriate solutions incorporated.

The Reputation of Russian Universities and their Particular Situation

New political and economical conditions have influenced the traditionally powerful Russian educational system and drained

it of many experts, either to industry, the private sector or abroad. Also, the current average technical and financial standards of academic institutions are low. An essential prerequisite is to eliminate such negative trends in order to restore the reputation of local universities and to keep prospective professionals there. Consequently, universities must be given the opportunity to demonstrate their strengths, realise their own perspectives, organise their resources and develop their administration in order to meet the demands of industry.

Lack of International Experience

Russian universities still do not have enough international experience and lack stable contacts with partners based in the EU. As such, they are unaware of their opportunities and the specific ways in which they can realise these opportunities. This is also partially due to the multilingual proficiency of their staff, which is, on average, low.

Disregarding the almost total absence of any information in English, a more alarming consequence of the international immaturity of the Russian academic domain is its unclear relation to the EU's educational system. Under such circumstances, it is difficult to accept Russian students into EU universities, because the only official document available for admission is their local study record.

Non-Transparency

Vaguely implemented, or altogether non-existent, standardisation process models, as well as weak frameworks or tools for the monitoring, management and quality assurance of these models, make the internal structure of Russian universities non-transparent.

Cultural Aspects

Russians have a specific cultural background that incorporates various national historical, ethnical, ethical and behavioural features. Although explicitly non-measurable, the practical impact of this legacy on the internationalisation process is significant.

The authors believe that the establishment of a common cross-border educational environment is a promising way of facilitating real cooperation between the best professionals from Southeast Finland and Northwest Russia. Logically, the Finnish universities located near the border must take the starting initiative in this process and transfer their EU expertise and practices into the Russian academic domain. Their extensive international experience, as well as their existing connections in this domain, is a sufficient qualification for such a role.

INTERNATIONALS MASTERS' PROGRAMME IN INFORMATION TECHNOLOGY (IMPIT): A DRIVING FORCE FOR DEVELOPMENT

General Characteristics of the IMPIT Programme

The Internationals Masters' Programme in Information Technology (IMPIT) is based on the active institutional cooperation among three Finnish and four Russian universities. The first programme applicants were accepted in 1998 and the

first students graduated from the programme in 2000. The total intake includes more than 120 students, approximately 50 of whom have already graduated.

IMPIT instruction is composed of continuously overlapping biennial cycles, including advanced courses in information technology, and culminates in the preparation of a Master's thesis. If necessary, students can apply for a scholarship. Detailed information on the goals, structure and teaching techniques of the programme can be found elsewhere [13]. As far as the Russian students are concerned, the authors have noted the following key aspects of students involved in the programme:

- They are well-motivated and hardworking students who have a good general background.
- They require guidance, have problems with creative tasks, teamwork and academic honesty.
- They form their own groups that remain isolated from the rest of the student community.

When assessing the programme itself, the following disadvantages were discerned:

- The scholarship system is expensive and, in some cases, even counter-motivating.
- Because of the non-existence of recognition procedures, Russians study both in IMPIT and in their local universities in order to obtain local diplomas.
- Russian academic staff are excluded from direct participation in IMPIT.
- The almost fixed study structure and absence of subsequent postgraduate study opportunities for IMPIT graduates (international PhD programmes and secondary education) make the programme less attractive and more isolated.
- Cultural differences, coupled with the period of time that Russian students spend in Finland, are a source of continuous tensions.

The above-listed characteristics indicate an evident need for considerable changes. The authors propose the following two main levels:

- Decision-making, which addresses the structure of study programmes and administrative and institutional arrangements;
- Work, which mainly includes the teaching and teaching technologies for individual courses.

The institutional effort resulted in the Cross-Border University (CBU) model. The part that relates to teaching was completed with the successful design and realisation of an international semi-virtual course.

FINAL STRUCTURE OF THE CROSS-BORDER UNIVERSITY

General Characteristics of the Institution

The Cross-Border University (CBU) is a virtual educational and research network that covers Southeast Finland and Northwest Russia. The CBU is aimed at improving the quality of teaching and strengthening the industrial and regional

impact of this area. The CBU also offers a stable background for an equal and creative international partnership, rather than a formal framework for the pure exploitation of local resources.

The CBU was established in accordance with the requirements and needs of all of the partners as a semi-virtual alternative to the traditional model of individually cooperating universities. Due to the internal flexibility and innovativeness of the CBU, the latest teaching, research and administrative technologies have been implemented in it. The CBU is open to new partners, both professionally and geographically.

Activites

Although the CBU is primarily an educational institution, the concept of sharing human resources via staff and student mobility is a good basis for performing common research and executing industrial projects, as Figure 1 shows. Overall regional development is the logical indirect consequence of the properly functioning CBU structure.

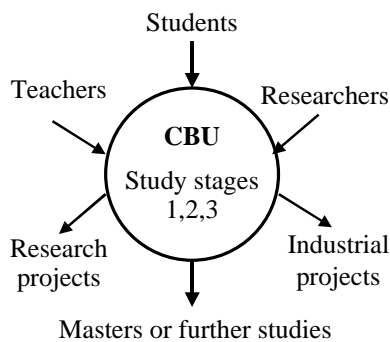


Figure 1: The Cross-Border University in the wider context.

Establishment

The CBU was established as the natural institutionalisation of existing bilateral relationships. The current practice of individually searching for project partners, which results in isolated activities with limited cross-communication, is replaced with a well-known entry point that provides services and expertise to institutions and individuals worldwide. To facilitate the transition period, the CBU was initially established in Finland and benefits from the local infrastructure and facilities. Finally, it is expected that will it be extended to Russia, as shown in Figure 2.

Administration

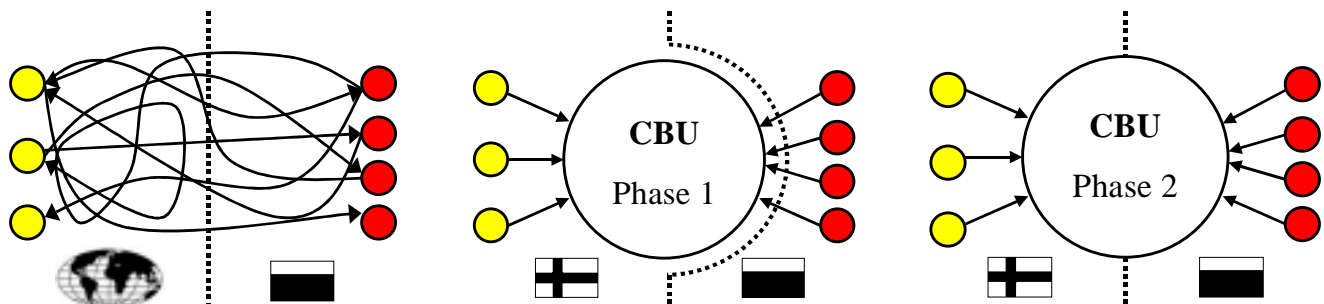
The administrative structure of the CBU has three levels with distributed rights and duties. This allows for individual partners to work in a deterministic environment and preserve a reasonable degree of independence (see Table 1).

Sophisticated communication channels and common data repositories must be established in order to support the overall exchange of information. Also, the process improvement and quality control mechanism should be implemented in the CBU administration from the very beginning.

Education

In order to guarantee the appropriate professional level of CBU students, as well as their continuous motivation and high standard of their studies, the following three educational stages are proposed to be implemented:

1. Interested students from partner universities will enrol locally in these institutions and, at the same time, in this first stage of the CBU. Such a status will give them the possibility to have, in addition to the standard package of basic university courses, an additional language and cultural education, combined with virtual or semi-virtual courses, lectured by CBU teachers in the students' own home universities. At this stage, any student mobility or direct financial support is not expected and the main goal here is to find the best individuals from among all of the initially interested applicants.
2. The students selected during the previous period are accepted for the CBU and follow their own international study programmes, completed with a double degree. Those who are unsuccessful continue as regular degree students in their home universities. Education in this stage includes advanced professional courses delivered with problem- and project-based teaching techniques. Special emphasis is placed on software engineering practices and practical project management skills. Semi-virtual teaching, combined with regular stages abroad (summer and winter schools, as well as temporary work on projects), is the main teaching technology at this stage.
3. CBU students are expected to work in Finnish or Russian companies, complete their masters' theses and other open projects. During this period, it is planned to develop features like professional ethics and teamwork or personal time management.



a) The initial situation, in which institutions individually search for Russian partners.

b) The transition period, during which the CBU core is established and coordinated from Finland.

c) The final status that represents the desired form of an equal and open partnership.

Figure 2: The three stages of the CBU establishment process.

Table 1: Administrative levels of the CBU.

Level	Structure and Tasks
Institutional (network)	<p>Decision-making board established from representatives of the partner institutions:</p> <ul style="list-style-type: none"> • Global planning and strategic decision making; • Distribution of finances. <p>Executive unit:</p> <ul style="list-style-type: none"> • Internal development and quality control; • Contacts with industry; • Extension of the network; • Practical coordination of partners; • Exchange of information.
Management of partner universities	<p>Local coordination unit:</p> <ul style="list-style-type: none"> • Integration of CBU-level processes into existing local structures. This, for example, requires new services or advanced guidance for foreign staff and students. <p>Establishment of working groups:</p> <ul style="list-style-type: none"> • Tackles the tasks of bilateral interest, such as the legal aspects of mutual cooperation, the recognition of credits, theses, double master's and doctoral degrees or the implementation of the Bologna structure. <p>The centre for the support of virtual education:</p> <ul style="list-style-type: none"> • Provides services, standards and technical arrangements related to virtual or semi-virtual education.
Departments of partner universities	<p>Teaching and development of single courses. Academic supervision of CBU students. Realisation of CBU research and industrial projects.</p>

After graduation from the CBU, students can continue working for their original companies, participate in research projects or apply for postgraduate or other degree studies (see Figure 1).

SEMI-VIRTUAL TEACHING

Semi-virtual teaching technology is based on multiple experiments in the area of international virtual education conducted since 2000. In several regular courses, many progressive technologies and tools have been tested, especially for their applicability from the point of view of the Russian academic domain.

The final specification, which concerns the applicability of cross-border teaching technology, finally included the following main requirements:

- A single lecturer must be able to deliver the same course, during the same period, to students in several locations;
- Close personal contacts between students and lecturers are necessary;
- The quality of semi-virtual education must be comparable with that delivered by traditional teaching methods;
- For developing and studying in courses, a standard, standalone personal computer is enough.

Recalling the key ideas of the CBU, the above-listed items can be extended as follows:

- Teachers regularly visit distant students.
- Content production is sub-contracted.
- The quality of course materials and teaching becomes a public issue.

The internal structure of the semi-virtual course model incorporates the following two types of entities:

- Regular blocks (typically five per semester) where each block includes audiovisual lectures and exercises, a quiz, homework and a discussion class with the teacher;
- Project, oral presentation and an examination at the end of the course.

Such distribution and diversity of tasks allow the study progress of students' to be monitored and teaching to be influenced when necessary. Block deadlines push students to work continuously, particular grades and bonuses are collected during the whole teaching period, and are projected onto their final classification.

Beyond the purely educational components, several bilateral and multilateral communication channels have been established with distant students for the following reasons:

- To compensate for the momentary absence of the teacher;
- To instantly support the learning effort;
- To establish a collaborative environment across the whole distributed study group.

The final prototype of such a course, which corresponds to 6 ECTS credits, was lectured in the autumn of 2002 to about 200 students from two Finnish and two Russian universities with promising results. Approximately 80% of the enrolled Russian voluntary students successfully completed this course with an excellent average mark of around 4.5 (on a scale of 1 to 5). Numerous positive qualitative statements were also collected from this experiment.

CONCLUSIONS

The proposed concept of the CBU represents a feasible and potential solution for future cross-border cooperation in the areas of education and research. In comparing it with the currently applied IMPIT model, the following key advantages have been identified at the institutional and teaching levels.

Institutional Level

Advantages at the institutional level include the following:

- A coordinated design of study programmes permits the most developed features, unique resources, advanced practices and best professionals to be shared among the partner institutions.
- The existence of a well-known entry point to the Russian educational system minimises the frequently cited disadvantages of isolated programmes, such as the problems with the dissemination of academic results or the *non-existence of a system and mechanisms for the accumulation and storage of acquired expertise*. The

international visibility and deterministic scheme of the CBU is likely to attract the interest of worldwide partners in a short space of time.

- Internal bilateral study agreements remove duplicate studies, provide international certificates to CBU graduates and introduce European certification procedures to Russian universities.
- The multilevel study structure and alternative outputs from the CBU make this institution attractive both for the students and industrial partners.
- The significant advantage of the CBU, resulting from its compact geographical distribution, is the possibility to employ its own staff who are truly committed to the institution. Consequently, local experts consider the CBU to be a strong, stable and prospective employer and do not need to search for better conditions abroad.

Such a tight relationship cannot be fully established through individual projects or through projects, in which travelling expenses are high and real work cannot be undertaken based on regular personal contacts.

Another important finding is that it is recommended that there be a future cross-border educational environment that originates primarily from the bottom, ie with initial investments being made in designer and semi-virtual courses. Once several such courses are properly underway, there will be more reliable evidence on the technical and institutional background needed in the future.

Teaching Level

Advantages at the teaching level incorporate the following:

- The outlined procedure for semi-virtual teaching is a potential technology for the initial stages of the CBU.
- The mobility of teachers in the cross-border region is less expensive than supporting prolonged presence of students in the host countries. Moreover, the results achieved with the new technology are better and the level of satisfaction higher.
- Sub-contracted content production does not require the direct employment of designers. The packaging of electronic course materials is reusable and open to future changes.
- The cultural tensions, which generally occur during long-term presence abroad, are minimised.

However, this solution is specific because of its close orientation to Russia and the wide range of problems addressed. Because of that, more explicit comparisons with similar existing initiatives were unable to be conducted. Furthermore, the constantly positive feedback from all of the stakeholders is encouraging for the project to continue in the outlined direction.

REFERENCES

1. Farrel, G. (Ed.), *The Changing Faces of Virtual Education*. Vancouver: Commonwealth of Learning (COL) (2001).
2. Mishra, A.K. and Bartram, J. (Eds), *Skills Development through Distance Education*. Vancouver: Commonwealth of Learning (COL) (2002).
3. International Assoc. of Universities, *Internationalisation and Globalization in Higher Education: a Selected Bibliography 1998-2003*. Paris: UNESCO (2003).
4. d'Antoni, S. (Ed.), *The Virtual University: Models and Messages. Lessons from Case Studies*. Paris: International Institute for Educational Planning & UNESCO (2003).
5. Lummeppuro, M., *Evaluation of the Academic Cooperation in Finland and North-West Russia*. Helsinki: Aleksanteri Institute and the Finnish Ministry of Education (2003).
6. Centre for International Mobility (CIMO), *Study in Finland. International Programmes in Finnish Higher Education 2003-2004*. Helsinki: CIMO (2003).
7. European Commission (EC), *Russian Federation Country Strategy Paper 2002-2006*. EC, 21-22 (2001).
8. European Commission (EC), *Russian Federation National Indicative Programme 2004-2006*. EC (2003).
9. European Commission (EC), *The Second Northern Dimension Action Plan*. EC (2003).
10. Ministry of Education of Finland, *An International Strategy for Higher Education*. Helsinki: Ministry of Education of Finland (2001).
11. Ministry of Education of Finland, *The Ministry of Education of Finland Strategy 2015*. Helsinki: Ministry of Education of Finland (2003).
12. Regional Council of South Karelia, *Interreg III A South-East Finland*. Lappeenranta: Regional Council of South Karelia (2003).
13. Voracek, J., Kontro-Vesivalo, N. and Luukko, A., *International education in information technology: results and experience. Proc. 13th Conf. on Innovations in Educ. for Electrical and Info. Engng.* (EAEEIE), York, England, UK (2002).



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