

The Nordplus Project helps to improve the study programs of Civil Engineering and Architecture

News submitted by: Elina Soininen

The objectives of the project "Nordic_BIM_edu – Development of skills for Building Information Modelling (BIM) in Nordic countries higher education“: exchange and dissemination of best practices and experience, integration of BIM technologies into architectural and civil engineering study programs; promotion of cooperation between higher education institutions and other organizations influencing the implementation of BIM in the construction industry, promotion of BIM cooperation and promotion of academic mobility among Nordic countries.

On September 20-21, 2018, after 15 months of the long-term cooperation between four higher education institutions of the Nordic countries - Kaunas University of Technology (Lithuania), Tampere University of Technology (Finland), Norwegian University of Science and Technology (Norway), Via University College (Denmark) - the closing ceremony of NORDPLUS project took place in Kaunas.

Activities for educational co-operation

The main activities of the project were designed to analyse and compare the policy issues of implementation of Building Information Modelling (BIM) in the Nordic countries, implementation processes in design and construction companies, and to analyse the implementation of BIM in the field of higher education. The expected result of the project was the finding of possible cooperation points in studies in the BIM area among the participating higher education institutions.

5 meetings were held during the project. The situation on the discussed topic was presented by The country participating in the project at each meeting. Moreover, the meetings were organised with the organizations responsible for the implementation of BIM or BIM's business activities. The architectural, engineering and construction companies and associations working with BIM, such as Public Institution Digital Engineering, UAB Concretus Designers, UAB AGA CAD, and AB YIT KAUSTA, were visited during the first meeting in Kaunas (August 2017, Lithuania). The development and implementation of the National Construction Classification in Lithuania was discussed during the meeting with Dalius Gedvilas, Director of Digital Construction. This meeting provided the participants of the project with a great opportunity to have a discussion with the representatives of large companies on the emerging challenges in development of the BIM method in the construction sector. It has been noticed that only large Lithuanian architectural or construction companies are ready to introduce BIM to the design and construction process.

State of the art discussions

The participants of the project discussed the legal, economic and social issues in the BIM integration process in each partner country of the project, the role of the

government in the BIM construction sector, the effectiveness of BIM strategies and national regulation during the second meeting in Denmark (November 2017). The meeting was focused on getting acquainted with the activities of the MOLIO - building information centre. MOLIO is an important contributor to the overall implementation of BIM in Denmark, as the organization initiated the creation of the classification system CCS (Cuneco Classification System). During the meeting with MOLIO, it has been noted that the resulting standards should benefit both individual users and companies and the industry as a whole. As a result, Cuneco conducts a forward-looking analysis of demand and value to help identify the priorities and define the projects that will lead to standards. The project includes the verification of the standards according to the actual construction projects in order to ensure that their suitability for IT integration. The project participants also met with the representatives of the architectural company ARKITEMA and M. T. Højgaard in Denmark, in which Frederik Ris-Pedersen, the VDC project leader, presented strategies for BIM and VDC in the M. T. Højgaard company (leading design and construction engineering group in the Nordic countries) in the context of Danish legislation. In addition to the aforementioned meetings, various ICT technologies and BIM laboratory equipment were presented while learning about the study process at the VIA University College.

BIM implementation analysis in companies

Before the meeting in Finland (2018 March), the project partners analysed the BIM deployment processes in the design and construction companies in their countries. The results of the analysis were presented in the meeting at Tampere University of Technology. The reports and discussions during the visit provided a general overview of the BIM admissions situation in Denmark, Finland, Lithuania and Norway. In general, the BIM adoption model looks quite similar in different countries. The level of acceptability between companies and public organizations varies greatly. It has been noticed that BIM technologies are used extensively in progressive and most often large-scale enterprises that develop large-scale construction projects such as supermarkets and office complexes. Meanwhile, BIM technologies are not available or not used in the design and construction of smaller buildings. Presentation of the situation in Lithuania included an observation that it will be mandatory to use BIM methods for the design and construction of all newly constructed complex and high value public sector buildings from July 1, 2022, but the Lithuanian Chamber of Architects (a professional self-governing organization of architects) is against the mandatory implementation of BIM because the Lithuanian market is not ready and any compulsory application of technology is considered an attempt to restrict competition. Meanwhile, such companies as Senaatti Properties (Finland) and Statstbygg (Norway) have set the requirements for the use of information modelling of buildings in their projects. BIM standards were developed for the development of these projects; today they are recognised as national BIM standards. The meeting included the discussion of the situation as well as the discussion with the students about their results and experience in the "Modelling of the construction design process" at the TUT, which focuses on multidisciplinary BIM co-operation in design. The study module is implemented through design meeting practices that simulate actual design meetings. Participating students from different disciplines form a design team in which each student is assigned a role (client, principal architect, engineer constructor and BIM coordinator). The task of the students is to design a building for a predefined need by modelling BIM processes.

BIM implementation analysis in educational institutions

Project participants had to carry out an analysis of BIM implementation in the field of higher education in March - June. KTU, VIA, NTNU conducted a SWOT analysis and a survey for the students of the Architecture study program. The survey aimed to find out the students' opinion about BIM. The results of this analysis were presented at the meeting in Trondheim, Norway, where the needs of the universities, specific demands, opportunities for adjustment of study processes and development of the implementation of BIM were discussed during the seminars. 120 students participated in the survey. The survey revealed that the majority of students from all countries understand the meaning of BIM; but the problem is that BIM is not very popular among architectural companies because the architectural environment is not developed enough for BIM implementation, they do not need this method because there are no particular requests from customers. The following general needs of the participants of the project were identified during the discussion: to increase the number of interdisciplinary projects; to promote the use of the BIM software at various study modules; to promote cooperation with companies operating in the field of BIM. In order to meet these needs, the main disadvantages of the universities were identified: lack of competences and motivation, unclear understanding of industrial needs. The priority directions of the activities of the Civil Engineering and Architecture program were identified - training of trainers and involvement of construction companies in the studies related to BIM.

BIM should be implemented to the studies

The Project's final meeting in Kaunas discussed the results of cooperation between the project partners. The International Scientific Conference "Advanced Construction" presented two reports prepared on the basis of the analyses carried out by the Nordplus project: "BIM Integration Possibilities in Different Study Cycles of Architecture Study Program" (Aušra Mlinkauskienė (KTU), Laura Jankauskaitė-Jurevičienė (KTU), Per Christensen (VIA University College), Luca Finocchiaro (NTNU), Gabriele Lobaccaro (NTNU)) and "Review of BIM Implementation in High Education" (J.Šadauskienė (KTU), D.Pupeikis (KTU)). This report was published in the International Journal of Sustainable Architecture and Civil Engineering (2018/1/22).

The utilization of BIM technologies is now reaching the stage where this is matter of increasing number of different trades and their professionals. BIM centric operations are getting more common, quality of BIM models and their data is essential. At the same time the BIM education need to meet such higher and broader demands. The results of the project "Nordic_BIM_edu - Development of skills for Building Information Modelling (BIM) in Nordic countries higher education" are the essential framework and preconditions for the beginning of further inter-university cooperation.

More information: [Toni Teittinen](mailto:toni.teittinen@tuni.fi), puh. 040 847 2322, toni.teittinen@tuni.fi