CENEAST

Reformation of the Curricula on Built Environment in the Eastern Neighbouring Area

Identification of the Appropriate Issues for Cross Institutional Module Sharing

By:
Name of the University, Country
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Tempus

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2 Promoting cross institutional module sharing

Vilnius Gediminas Technical University implements cross institutional module sharing through Tempus projects. The projects are based on multilateral partnerships between higher education institutions in the EU and the Partner Countries. They promote the exchange of knowledge and know-how between EU universities and institutions in the Partner Countries and between Partner Country institutions themselves in various cases (Education Audiovisual & Culture Executive Agency 2013). There are now three Tempus projects underway at Vilnius Gediminas Technical University. Vilnius Gediminas Technical University also subscribes to the following databases:

- ACS (American Chemical Society) Publications,
- Cambridge Journals Online (2003-2006) archive,
- eBooks on EBSCOhost,
- EBSCO Publishing,
- Ebrary,
- Emerald Engineering eJournlas Collection,
- Emerald Management eJournals Collection,
- IOPscience EXTRA (Institute of Physics),
- IOP Publishing Archive collection 1874-1999,
- Oxford University Press Journals Collection,
- Oxford Reference,
- Grove Art Online,
- Grove Music Online,
- Refworks,
- SAGE Journals Online,
- SciVerse (Science Direct),
- SciVerse (ScienceDirect) eBooks,
- SpringerLink Computer Science Collection Books 2011-2012,
- SpringerLink Engineering Collection Books 2011-2012,
- Springer LINK,
- Springer Link Archive,
- Taylor & Francis,

The databases are used in research and to craft individual parts of modules. Abstracts of publications available in the databases are accessible not only to VGTU employees, but to all scientists worldwide.
Global practices and an analysis of the need for cross institutional module sharing discussed below show that foreign universities are in great need of cross institutional module sharing, because there are few highly qualified university teachers with interdisciplinary knowledge able to develop high quality interdisciplinary modules. Cross institutional module sharing, thus, may help individual universities update their study programmes by adding top quality course modules relevant worldwide, in collaboration with other universities around the globe.

To ascertain the need for cross institutional module sharing, available modules were analysed with the help of Google Search to measure how often a module is mentioned in the internet. The results of the analysis are summarised in Figure 1-3.

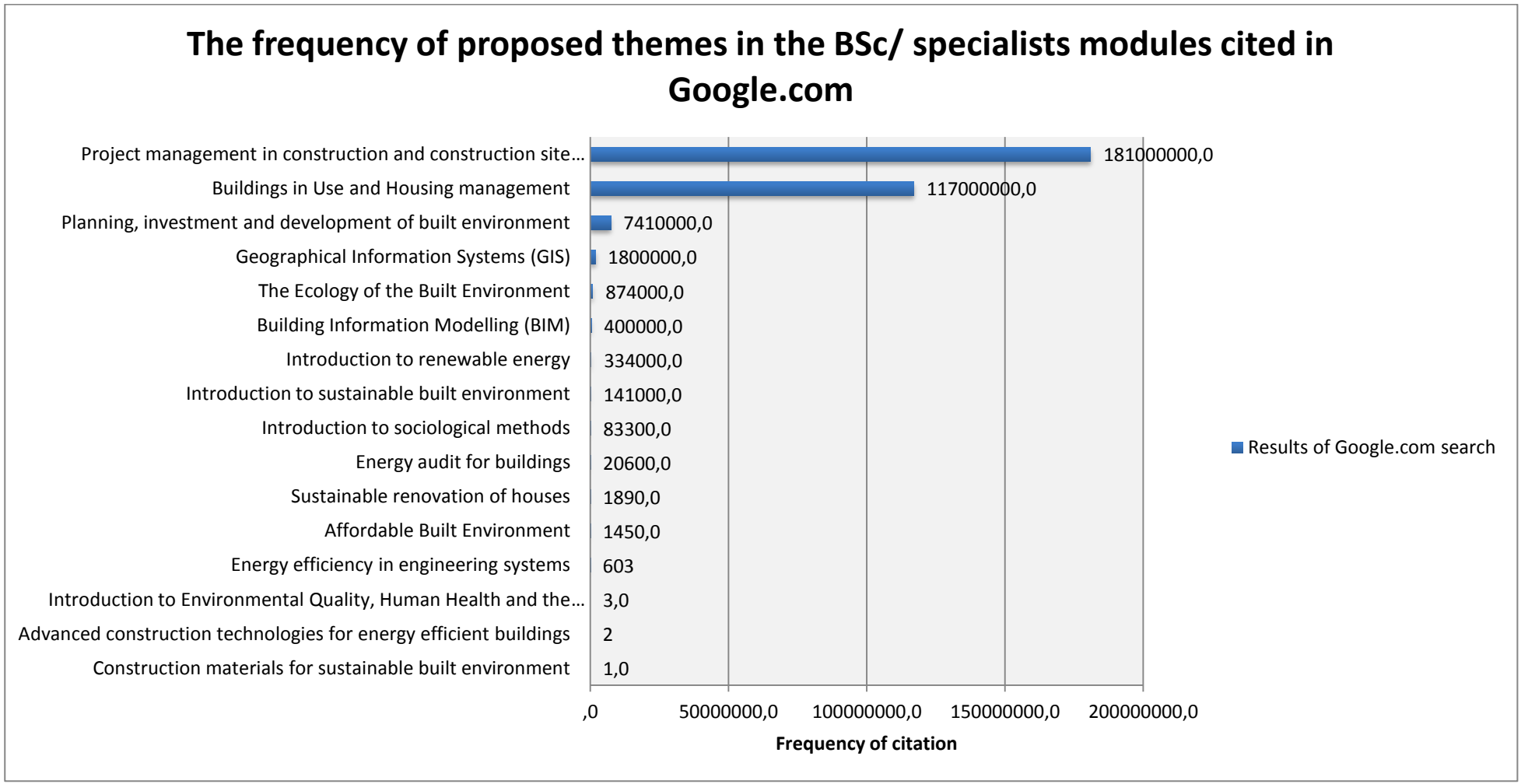


Fig. 1 . The frequency of proposed themes in the BSc/ specialists modules cited in Google.com

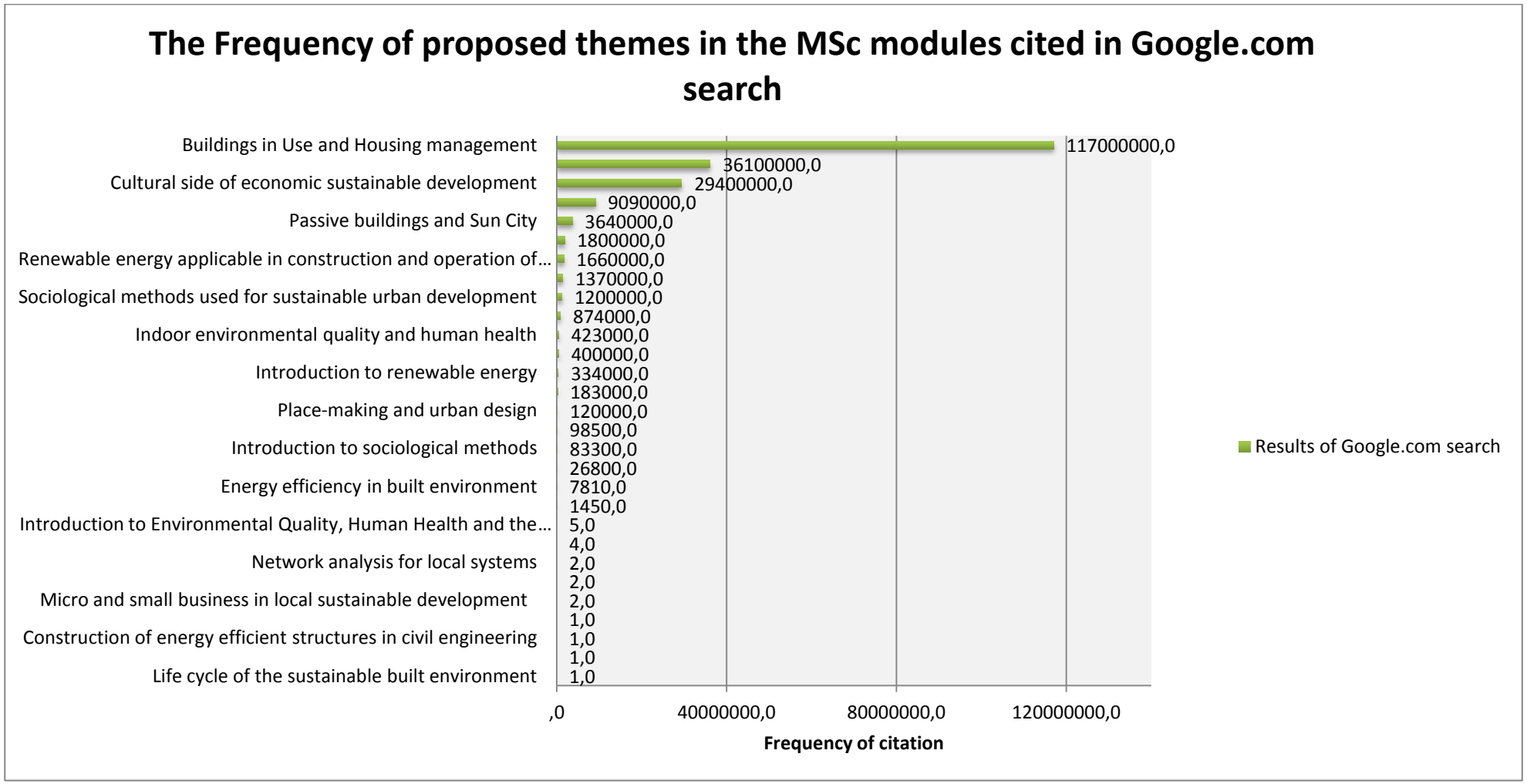


Fig. 2 . The Frequency of proposed themes in the MSc modules cited in Google.com search

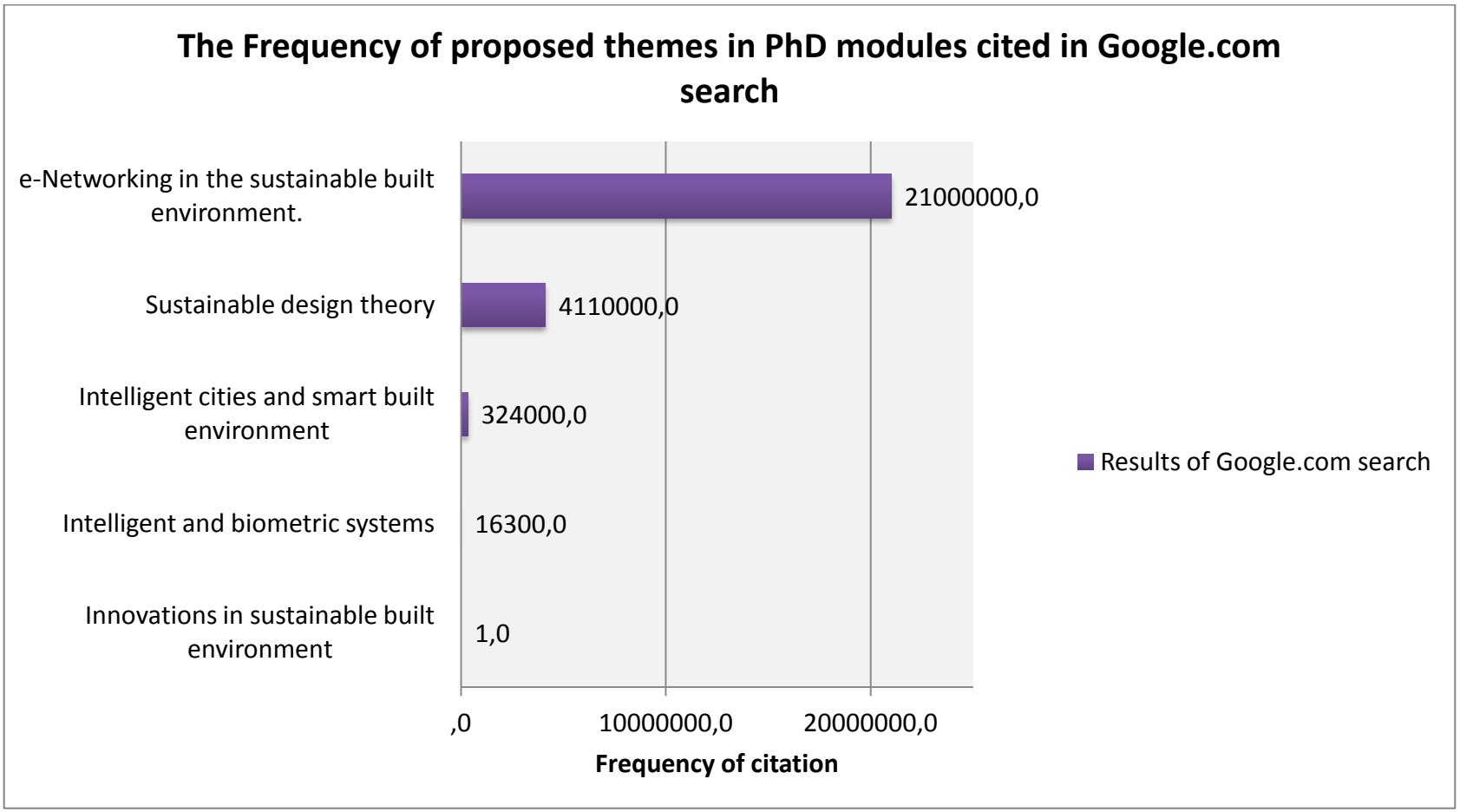
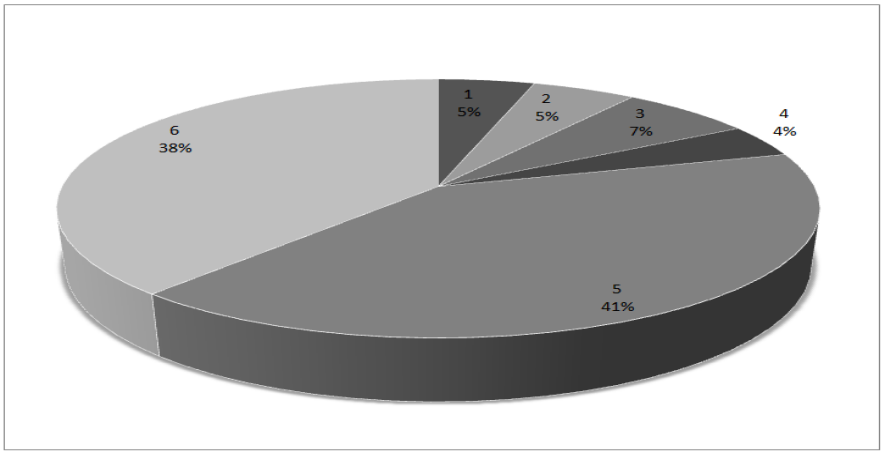


Fig. 3. The Frequency of proposed themes in the MSc modules cited in Google.com search

To identify the needs in the market of built environment and the need for energetically and ecologically sustainable, affordable and healthy built environment, the Vision for Civil Engineering in 2025 published by the American Society of Civil Engineers has been considered; it has been used as a guide to determine the skills a civil engineer will have to possess in 2025. Our detailed analysis was carried out taking into account the following statements:

1) **The graduates shall have sufficient knowledge and skills for the implementation of the following projects** (ASCE Curriculum …, 2007, ASCE Task …, 2007, Jha and Lynch, 2007, Lynch, et al. 2007)



1 - Investigation and definition of the issue, determination of limits set for external environment, balance, health, safety, risk of the Project

2 - Understanding of costumers' needs, importance of esthetical and other qualitative parameters

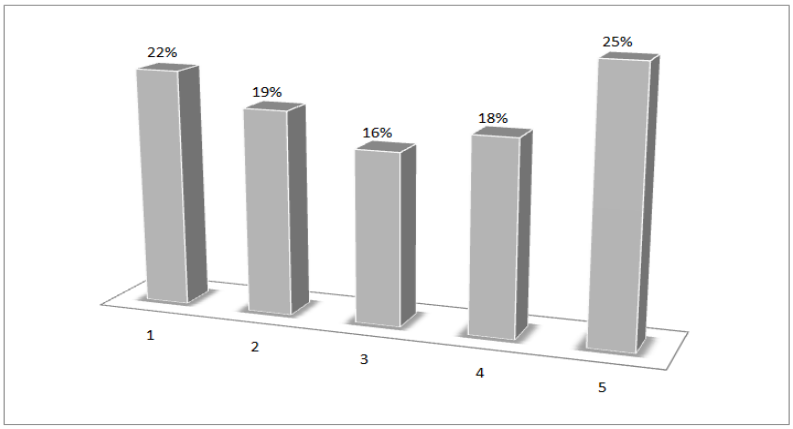
3 - Determination and management of costs and expenditures

4 - Creative determination of modern decisions

5 - Ensuring effective implementation of team goals within the whole life cycle of the project (production, management, supervision, disposal, etc.)

6 - Management of Project development process and assessment of the results gained

2) **The Graduates shall be able to assess economical, social and environmental context** (ASCE Curriculum …, 2007, ASCE Task …, 2007, Jha and Lynch, 2007, Lynch, et al. 2007)



1 - Understanding of commercial and economical context of engineering process

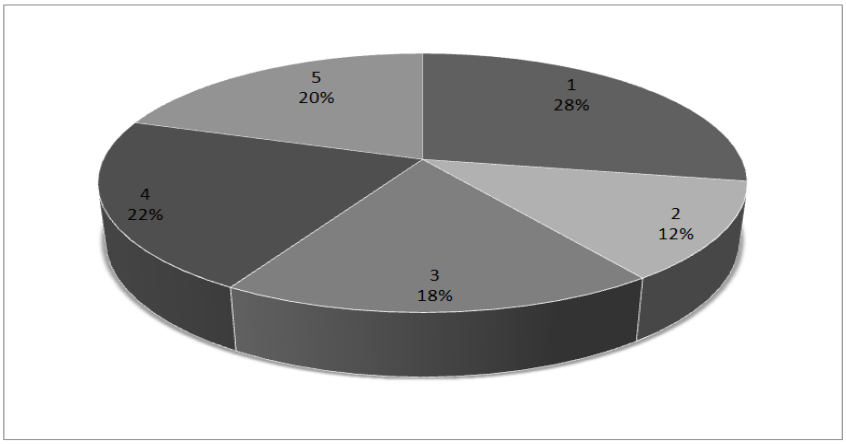
2 - Knowledge about management methods, in order to gain engineering goals within the particular context

3 - Understanding of the requirements set for engineering activity required in order to stimulate balanced development

4 - Understanding of legislative requirements, regulating engineering activity (regarding personnel, health and risks issues)

5 - Understanding of the importance of high level professional and ethical behaviour for civil engineering

3) The graduates shall have particular practical skills (ASCE Curriculum …, 2007, ASCE Task …, 2007, Jha and Lynch, 2007, Lynch, et al. 2007)



1 - Knowledge about precise materials, products, tools, processes, and technologies

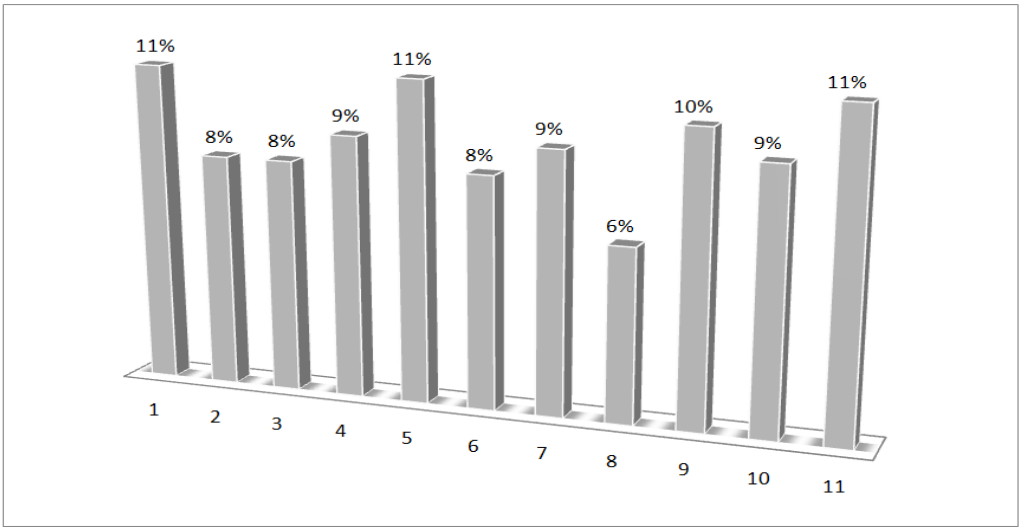
2 - Experience got from activities in laboratories or seminars

3 - Ability to apply knowledge about engineering (operations and management, development of technologies) for particular spheres

4 - Knowledge about effective application of technical literature or other information sources

5 - Understanding of legislative acts and industrial standards, regulating engineering activity

4) Engineering programmes shall train students in the following subjects (ASCE Curriculum …, 2007, ASCE Task …, 2007, Jha and Lynch, 2007, Lynch, et al. 2007)



1 - Ability to apply knowledge of mathematics, natural science and engineering

2 - Ability to design and execute experiments, analyze and interpret/explain obtained results

3 - Ability to design systems, components or processes in accordance with the results to achieve, in order to meet real economical, environmental, social, political, ethical, health and safety, production and stability limitations

4 - Ability to carry out interdisciplinary team work

5 - Ability to recognize, formulate and solve engineering issues

6 - Understand professional and ethical liability

7 - Ability to communicate effectively

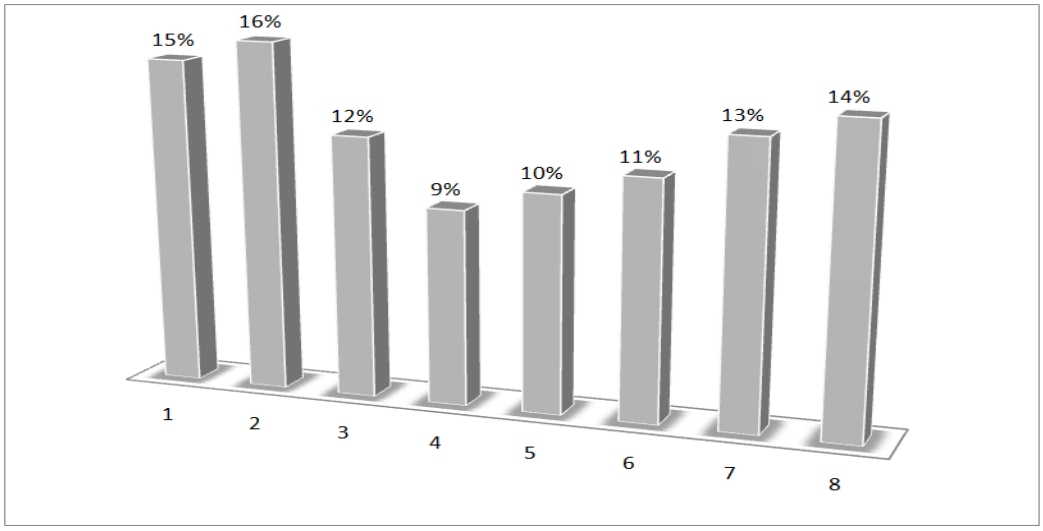
8 - Have wide education in order to understand the influence of engineering solutions within international, economical, natural and public context

9 - Wish and recognition of the importance of the education lasting the whole life

10 - Knowledge about modern problems

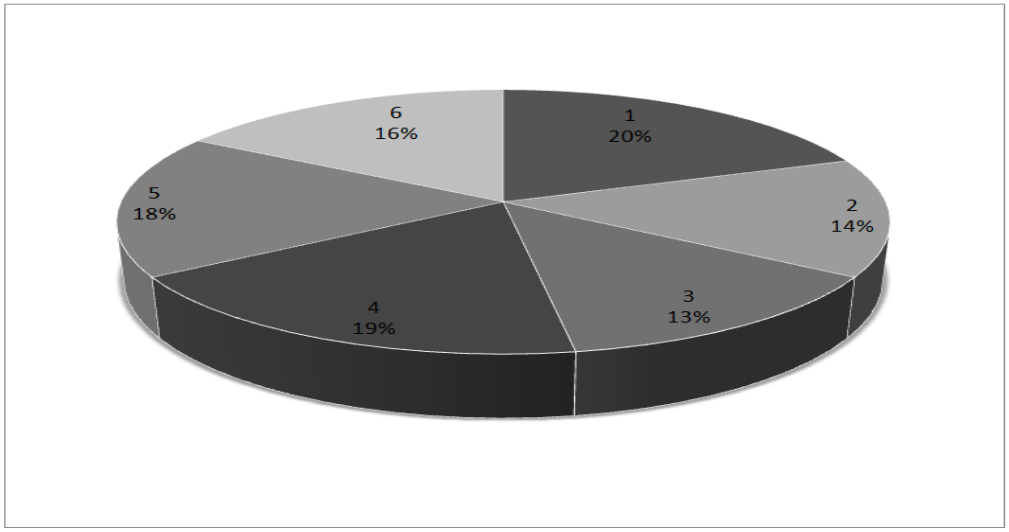
11 - Ability to apply modern engineering technique, technologies, skills for engineering practice

5) Engineering programmes shall train students for competent execution of research tasks (ASCE Curriculum …, 2007, ASCE Task …, 2007, Jha and Lynch, 2007, Lynch, et al. 2007)



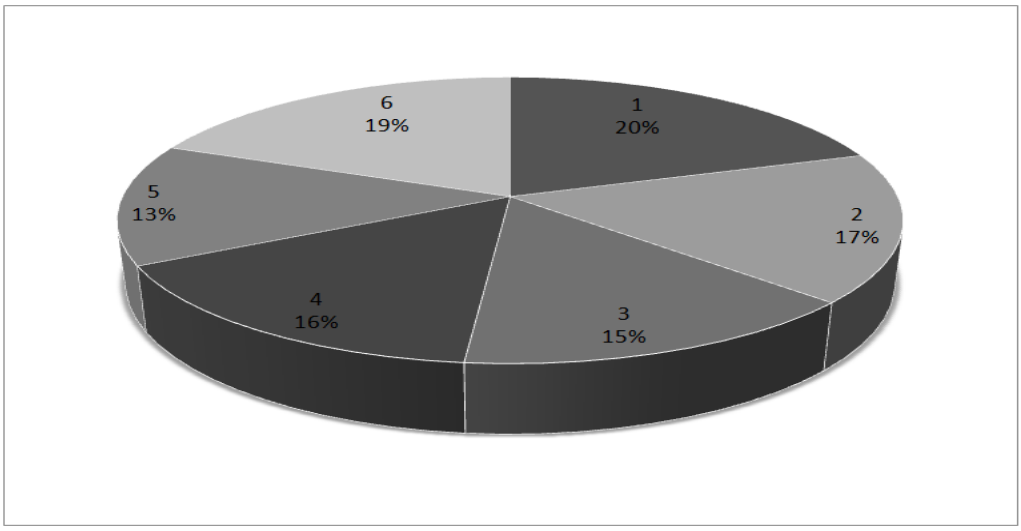
1	-	Reformulation of poorly formulated research tasks. Pays attention to limits of the system. Justifies new interpretations and alternatives for concerned parties
2	-	Students shall be attentive and observant, creative and able to solve every day engineering issues in accordance with the requirements of the concerned parties
3	-	Students shall be able to execute research researches under supervision
4	-	Students shall be able to work at various abstraction levels
5	-	Students shall understand the importance of interdisciplinary knowledge and knows how to apply it
6	-	Students shall understand varying direction of research researches induced by external factors or improved understanding
7	-	Students shall be able to evaluate the availability of particular research researches
8	-	Students shall be able to participate in the development of research knowledge of one or several related engineering spheres

6) **All students shall assimilate principles of research during studies** (ASCE Curriculum …, 2007, ASCE Task …, 2007, Jha and Lynch, 2007, Lynch, et al. 2007)



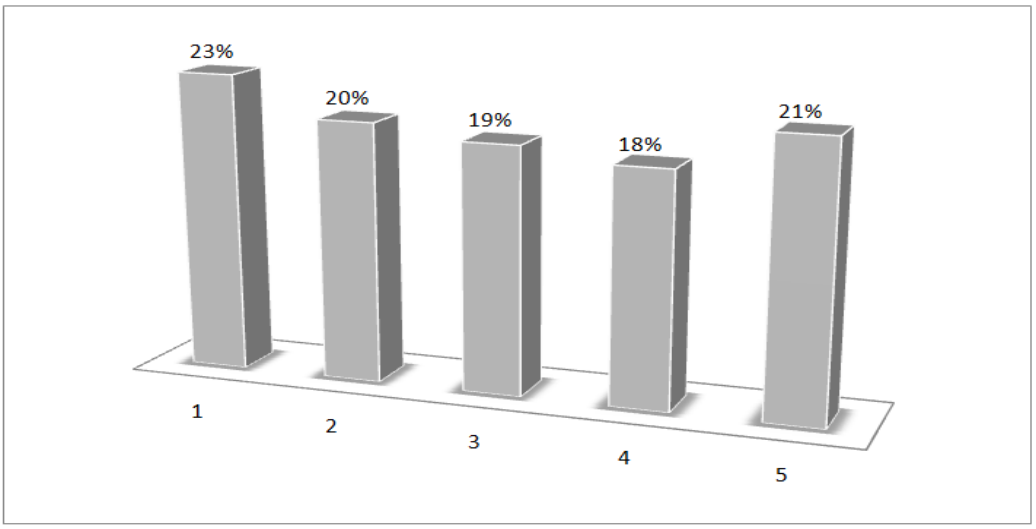
1	-	Students shall be curious and biased towards continuous study
2	-	Students shall solve tasks applying theories, models and interpretations of system approach
3	-	Students shall be able to apply practically different models
4	-	Students shall understand the basis of engineering science and technologies (essence, methods, differences and similarities of research spheres, nature of laws, theories, descriptions, objectivity, role of the experiment)
5	-	Students shall understand research practice (research systems, relations with clients, information systems, integration importance)
6	-	Students shall be able to document research and project results, take part in the development of engineering knowledge base

7) Students shall have the following general intellectual skills (ASCE Curriculum …, 2007, ASCE Task …, 2007, Jha and Lynch, 2007, Lynch, et al. 2007)



1	-	Students shall be able to evaluate own thinking, decision making and activity critically under supervision and change the above attitudes in accordance with the internal and external deviations of the activity
2	-	Students shall be able to think logically and answer questions „What if“ and „Why“ raised for own and related engineering spheres
3	-	Students shall know how to apply inductive, deductive, analogy methods for their activity
4	-	Students shall ask particular questions, shall have critical and constructive point of view for task analyzing and solving
5	-	Students shall be able to form reasonable point of view in case of uncompleted or indirect information
6	-	Students shall be able to take part in research discussions of related topic effectively

8) Graduates shall have skills to be applied for other spheres (ASCE Curriculum …, 2007, ASCE Task …, 2007, Jha and Lynch, 2007, Lynch, et al. 2007)



1	-	Students shall be able efficiently to work on their own or in team
2	-	Students shall be able to perform effective communication with engineering community and broad public with the help of different methods
3	-	Students shall know about: legal issues concerning health and safety, engineering practice liability; influence of the engineering solutions on public and environment; professional ethics, obligations of the engineering activity and standards
4	-	Students shall understand project management and business practice, including all limitations (for example, risk management and deviation management)
5	-	Students shall understand the importance of continuous studying and shall have the intention to do it all the life

For all responses, experience (38%) and communication skills (30%) rated as the most important skills needed by project managers. Companies with over $200M revenue placed a higher value on communication skills (46% vs. 26%) compared to smaller companies (<$200M). Overall, respondents rated financial management as the skill that new candidates lack most when entering the workforce (34%), then communication skills (28%), and experience (23%) with technical skills ranked only 14%. Larger companies more often said that communication skills were most lacking in new candidates (42%) with financial management skills the next concern on the list (35%). Larger organizations place a greater emphasis on communication skills than on financial management skills, or experience. This reflects the need to communicate with more people and departments in a larger company internally. Other resources available in larger companies fill the gap for lack of financial management skills, technical competency, and experience. Generally, the weakness in skills of new project management candidates reflects disconnect between universities and contractors. If contractors make it known that they are mostly concerned with technical skills, universities are more likely to turn out graduates strong in technical skills. Universities may respond by adding financial management and communications course materials to the curriculum; however, additional coursework adds time and expense to the attainment of a qualified degree. The alternative for most is to get the training once they enter the workforce through mentoring, on-the-job training, or third-party training programs. The most expensive of these choices is most often the on-the-job method, especially if it means the student has to make several costly errors before he or she learns the right way to go about it (FMI 2006).

According to the FMI Project Management Survey the top five weakest skill sets noted by all respondents were (FMI 2006):

- Cost to complete and profit projections (21% of responses).
- Time management (12%).
- Closeout skills (11%).
- Communication (written) (10%).
- Change order management (10%).

The top five strongest skill sets noted by all respondents were (FMI 2006):

- Client/customer relations (35%).
- Understanding the building process (27%).
- Change order management (8%).
- Cost to complete and profit projections (6%).
- Communication (written) (5%).

The good news when it comes to skill sets is that project managers are best at client/customer relation skills, and they understand the building process. These skills are in line with the two traits that contractors place the most emphasis on when hiring project managers—experience and communication skills. At the same time, communication skills and experience are among the top causes for concern for construction executives with their project managers. There is no single area that all project managers are weak or strong in, but most have sufficient building experience to understand the process. If the goal is to create project leaders, then project managers will need a well-rounded set of skills. It is typical that, over the course of a career, the project managers that become true project leaders increasingly focus on improving their "soft skills," which includes management and leadership skills (see Figure 2, FMI 2006).

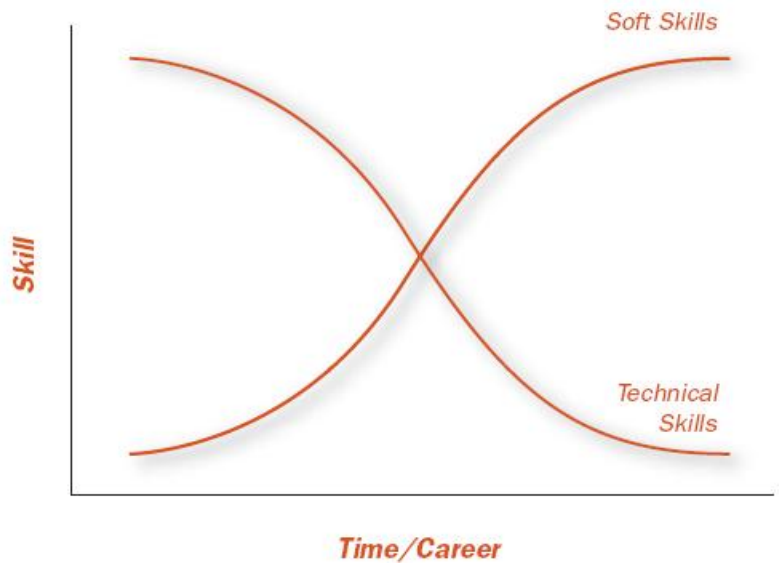


Figure 1. Project leader skills change over the course of a career (FMI 2006).

When we examine the ideal project leader model, it appears we are really thinking about three different people with three different skill sets. Companies look most often for project experience when evaluating new project managers, followed by communication skills. Technical skills are assumed for most project managers entering the job market, especially when the requirement is a four-year construction management degree. Little, if any, emphasis is placed on financial management skills, yet that is the area reported as lacking most often when new project managers enter the workforce. In the FMI Project Leader Model, possessing just one skill is not enough, nor is it enough to have skills in all three areas, if one is operating in a vacuum. To be most effective, the true project leader applies all of these skills collaboratively, and mission-critical processes are designed with this in mind (FMI 2006).

The companies reporting the highest rate of on time/on budget performance place the highest emphasis on communication skills, yet only about 16% of companies overall said that a four-year, non-technical degree was a minimum requirement. That degree likely would produce candidates stronger in the two areas that concern companies the most—communication skills and financial management. It is typical for a company in an industry as technical as the construction industry is to emphasize project experience for new candidates. Project mistakes can be dangerous and costly. It seems that, historically, the general belief has been that a construction firm needs to hire experience and technical skills, and the other, softer, skills will be learned on the job. Often this approach has produced unsatisfactory results, especially if a firm hasn't identified their project management best practices and haven't reinforced the project manager as planner, communicator, and businessperson (FMI 2006).

Project management qualifications, experience and skills required in Wired Consulting are presented in Table 1. Kaip matome, kylant karjeros laiptais projekto vadovams keliami vis didesni reikalavimai.

Table 1. Project management qualifications, experience and skills required in Wired Consulting (Wired Consulting 2010)

Role	Program Manager	Senior Project Manager	Project Manager	Junior Project Manager	Project Coordinator
Minimum Experience	10 years managing large complex projects	5 years experience as a Project Manager	3 years experience as a Project Manager	12+ months experience as a Project Manager	18 months experience working in a project team
Qualification	Practitioner level MSP/PMBOK / PRINCE2	PMBOK (PMP) / PRINCE2 Practitioner	In-depth knowledge of PMBOK / PRINCE2	Understanding of PMBOK / PRINCE2	Understanding of Project Management techniques
Responsibilities	Ability to manage a number of project plans and costs and their interdependencies on resources and schedules	Ability to create project plans and schedules, manage milestones, deadlines and budgets through to successful satisfaction of the customer	Ability to create project plans and schedules and then manage milestones, deadlines and budget through to successful satisfaction of the customer	Ability to create project plans, schedules manage milestones and deadlines. through to successful satisfaction of the customer	Provides administration and coordination to the project team
3rd Party Management	Strong Ability to manage 3rd parties to ensure deliverables are timely and on budget	Ability to manage 3rd parties to ensure deliverables are timely and on budget	Ability to manage 3rd parties to ensure deliverables are timely and on budget	Ability to co-ordinate 3rd parties to ensure tasks are delivered on time.	Supports the project team by applying the Management System to project tasks
Client Relationship	Sole accountability for the Program to the client managing the implementation interface to the telecoms supplier	Strong relationship building skills to ensure that the requirements understood within the capabilities of the provider	Good relationship building skills to enable smooth communication between the client and the supplier	Good relationship building skills to enable smooth communication between the client and the supplier	Supports project team through ensuring smooth communications across project team members
Financial Management	Overall Management of time & costs to ensure that the Program is delivered to scope and budget	Overall Management of time & costs to ensure that the Project is delivered to scope and budget	Management of time & costs to ensure that the Project is delivered to scope and budget	Co-ordination of time & costs to ensure that the Project is delivered to scope and budget	Sources financial information on behalf of the Project Manager and collates as required
Reporting	Timely and regular progress and Risk Management reporting	Timely and regular progress and Risk Management reporting	Timely and regular progress and Risk Management reporting	Timely and regular progress and Risk Management reporting	Responsible for collating and dissemination of progress and reporting
Attitude	Pro-active, "can do" attitude	Pro-active, "can do" attitude	Pro-active, "can do" attitude	Pro-active, "can do" attitude	Pro-active, "can do" attitude

In the global market, modern organizations face high levels of competition. In the wake of increasingly competitive world market the future survival of most companies, depends mostly on the dedication of their personnel to companies. Employee or personnel performances such as capability, knowledge, skill, and other abilities play an important role in the success of an organization. Competencies in organizations can be broadly classified as employee-level and organizational-level.

A core competency can take various forms, including technical/subject matter know-how, a reliable process and/or close relationships with customers and suppliers. Core competencies are the source of competitive advantage and enable the firm to introduce an array of new products and services. Core competencies lead to the development of core products.

Competencies could be very diverse. For example, Goleman (2010) has developed the following model of competencies:

- Personal competence: these competencies determine how we manage ourselves:
    - Self-awareness: knowing one's internal states, preferences, resources and intuitions.
    - Emotional self-awareness: recognising one's emotions and their effects.
    - Accurate self-assessment: knowing one's strengths and limits.
    - Self-confidence: a strong sense of one's self-worth and capabilities.
    - Self-management: managing one's internal states, impulses and resources.
    - Self-control: keeping disruptive emotions and impulses in check.

- Trustworthiness: maintaining standards of honesty and integrity.
- Conscientiousness: taking responsibility for personal performance.
- Adaptability: flexibility in handling change.
- Achievement-orientation: striving to improve or meeting a standard of excellence.
- Initiative: readiness to act on opportunities.

- Social competence: these competencies determine how we handle relationships:
  - Social awareness: awareness of others' feelings, needs and concerns.
  - Empathy: sensing others' feelings and perspectives, and taking an active interest in their concerns.
  - Organisational awareness: reading a group's emotional currents and power relationships.
  - Service orientation: anticipating, recognising and meeting customers' needs.
  - Social skills: adeptness at inducing desirable responses in others.
  - Developing others: sensing others' developmental needs and bolstering their abilities.
  - Leadership: inspiring and guiding individuals and groups
  - Influence: wielding effective tactics for persuasion.
  - Communication: listening openly and sending convincing messages.
  - Change catalyst: initiating or managing change.
  - Conflict management: negotiating and resolving disagreements.
  - Building bonds: nurturing instrumental relationships.
  - Teamwork and collaboration: working with others toward shared goals. Creating group synergy in pursuing collective goals.

Interpersonal skills may include leadership skills, verbal and non-verbal communication skills, decision making, dealing with emotions and stress, conflict management, trust building, negotiating, demonstrating sensitivity to diversity issues, and modeling desired behavior. The application of interpersonal skills may be influenced by the phase of the project life-cycle.

To identify what study programmes in energetically and ecologically sustainable, affordable and healthy built environment are available at universities around the globe, we turned to an online analysis of the existing BSc, MSc and PhD study programmes promoting this kind of built environment. The analysis involved looking around the globe for any universities that offered corresponding study programmes related to energetically and ecologically sustainable, affordable and healthy built environment. In the analysis, the programmes were grouped by the cycles of higher education, which were BSc, MSc and PhD. Study programmes that cover topics similar to those mentioned above have been found in a number of universities around the globe. The universities are listed in Table 2.

Table 2. The universities that offer study programmes promoting energetically and ecologically sustainable, affordable and healthy built environment

No.	University	Country	Programme title (Qualification)
1.	Birmingham City university	UK	Planning, Environment and Development (BSc) Environmental Sustainability (PgCert/PgDip /MSc) Environmental Sustainability (Design and Construction) (PgCert/PgDip /MSc)
2.	University of Central Lancashire	UK	Sustainable Energy Management (BSc) Building Services (MSc) Urban Environmental Management (MSc)
3.	Sheffield Hallam University	UK	Built Environment (BSc) Building surveying (MSc)
4.	The Hong Kong University of Science & Technology	PRC	Environmental Management and Technology (BSc)
5.	Plymouth University	UK	Environmental Construction Surveying (BSc) Building Surveying and the Environment (BSc) Environmental Consultancy (MSc) Learning for Sustainability (MSc)
6.	Stony Brook University	USA	Environmental Design, Policy and Planning (BSc)
7.	Kingston University London	UK	Sustainable Development (BSc (Hons))

			Sustainability for Built Environment Practice (PgCert/PgDip/MSc/MA)
8.	Northumbria University	UK	Sustainable Development in the Built Environment (MSc)
9.	London's Global University	UK	Facility & Environment Management (Singapore) (MSc)
10.	Nelson Mandela Metropolitan University	ZA	Built Environment (MSc / PGD)
11.	The University of Nottingham	UK	Sustainable Energy and Entrepreneurship (MSc)
12.	University of Brighton	UK	Construction Management (MSc/PGCert/PGDip) Facilities Management (MSc/PGCert/PGDip) Project Management for Construction (MSc/PGCert/PGDip) Environmental Assessment and Management (MSc/PGCert/PGDip) Sustainability of the Built Environment (MSc/PGCert/PGDip) Town Planning MSc (PGCert/PGDip)
13.	University of Dundee	UK	Advanced Sustainability of the Built Environment (MSc/PGDip)
14.	University of Washington	US	The Built Environment (PhD)
15.	Clemson university	US	Planning, Design and the Built Environment (PhD)

Next, the study programmes promoting energetically and ecologically sustainable, affordable and healthy built environment (and their modules) available at the universities listed above are outlined, all grouped by the cycle of higher education.

A statistical analysis was carried out to identify which modules were the most common in the existing BSc, MSc and PhD study programmes promoting energetically and ecologically sustainable, affordable and healthy built environment. The keywords related to energetically and ecologically sustainable, affordable and healthy built environment and most common in the modules were picked out and their frequency rate determined. Figure 4 shows the most common keywords found in the existing BSc study programmes offered by universities around the world.

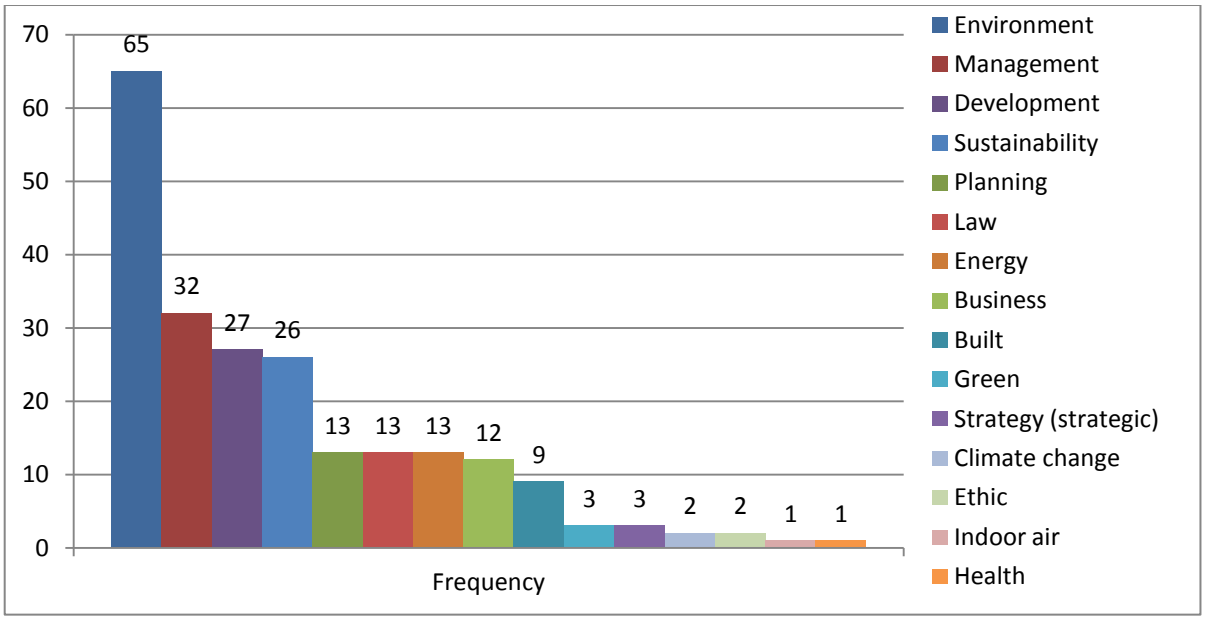


Figure 4. The most common keywords related to energetically and ecologically sustainable, affordable and healthy built environment in BSc study programmes offered by universities around the world

Figure 4 shows that the BSc study programmes in question offered by universities around the world most often comprised modules with such keywords as "environment", "management", "development", "sustainability", "planning" and "law". Figure 1 also shows that "Environment" was the most common word in the said study programmes with 65 instances. All other keywords were less common: "management" appeared 32 times, "development" 27 times, "sustainability" 26 times, "planning" 13 times, "law" 13 times, "energy" 13 times, and "business" 12 times. The least common keywords were "climate change", "ethic", "indoor air" and "health". Thus, environmental modules prevailed in BSc study programmes.

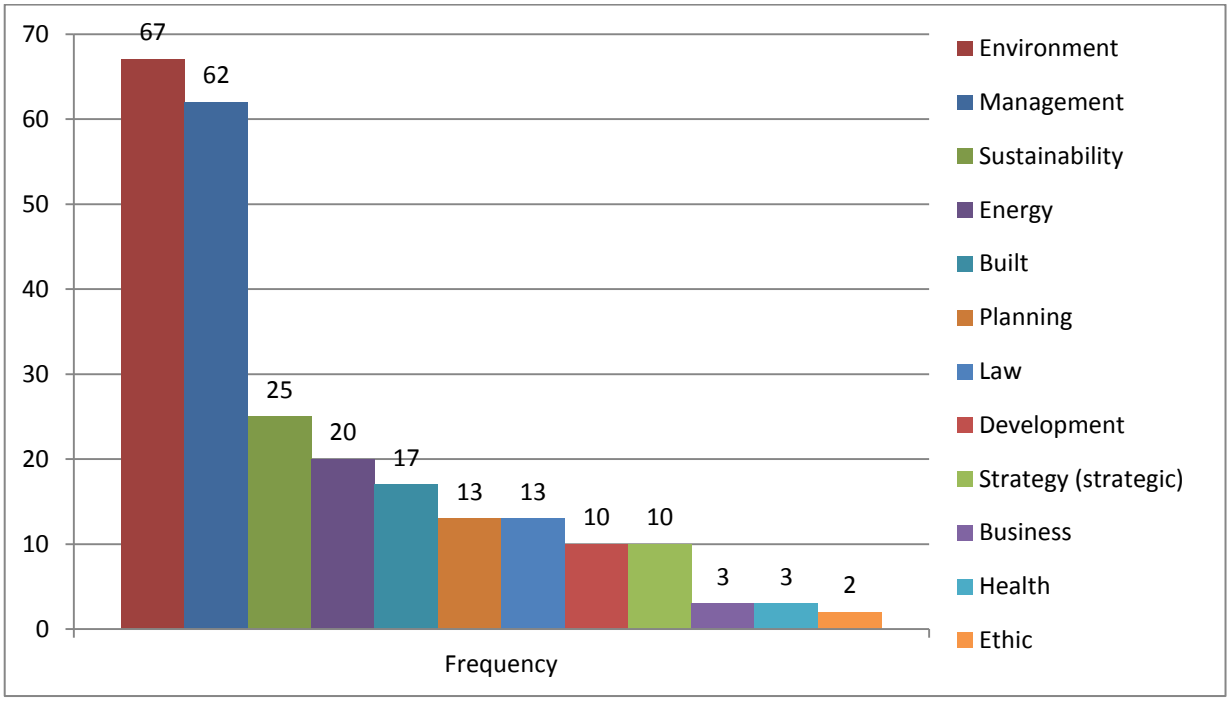


Figure 5. The most common keywords related to energetically and ecologically sustainable, affordable and healthy built environment in MSc study programmes offered by universities around the world

Figure 5 shows the keywords most common in the MSc study programmes. In contrast to the BSc cycle programmes, environmental modules did not dominate alone, with more modules on management, as shown in Figure 2: "environment" appeared 67 times and "management" as many as 62 times. "Sustainability" and "energy" were slightly less common, with 25 and 20 instances respectively. The least common keywords were "Business" and "Health" with 3 instances each, while "Ethic" appeared only twice throughout all MSc study programmes.

Finally, to determine the number of books available for each module related to energetically and ecologically sustainable, affordable and healthy built environment, the books listed on Amazon.com were analysed (Figure 6). The website was scanned for books related to the BSc, MSc, PhD modules suggested in the Project Proposal. The analysis revealed that the books covering the topic "Geographical information systems" made the largest pool with 10,270 titles. The numbers of books covering other topics were slightly lower: "Introduction to sociological methods" came second with 706 titles and "Introduction to renewable energy" came third with 412 titles. The numbers of books covering other topics varied between 10–200 titles. The modules "Micro and small business in local sustainable development" and "Planning, investment and development of built environment" come last with only one title for each.

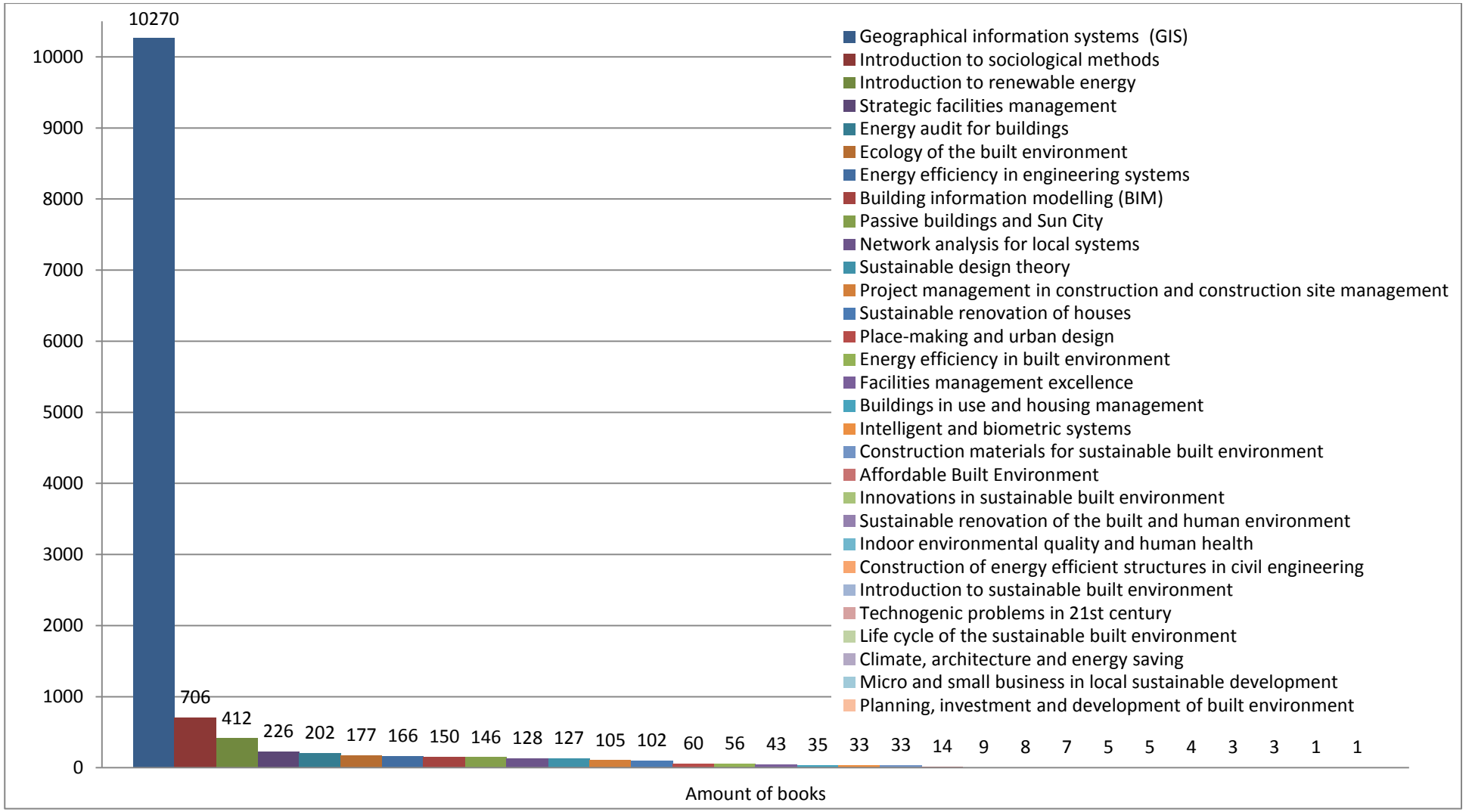


Figure 6. The number of books by the modules available in BSc, MSc and PhD cycles

3 Readiness of the university for cross institutional module sharing

Intellectual property (IP) applies to all creative works, including PowerPoint presentations, text quotations, conferences, didactic and scientific works, and, by extension, online courses. At Vilnius Gediminas Technical University, course modules, as a product of intellectual efforts, are subject to the provisions laid out in the Law on Copyright and Related Rights of the Republic of Lithuania. In view of Article 9(2) of this law, which reads "An author's economic rights in a work, other than a computer programme, created by an employee in the execution of his duties or fulfilment of work functions shall be transferred to the employer for the period of five years, unless otherwise provided for by an agreement", universities manage, use and dispose of all their property, including intellectual property, in line with the Law on Management, Use and Disposal of State and Municipal Property of the Republic of Lithuania, which stipulates that state property held in trust by universities may be transferred to other entities, or made available for their use, only by a resolution of the Government of the Republic of Lithuania. Property owned by universities may be transferred to other entities, or made available for their use, by a resolution of university's Council [Law on Higher Education and Research of the Republic of Lithuania, Article 20(2)(5)]. Study programmes, therefore, may not be transferred to other entities granting them ownership rights or for temporary use without a prior resolution (or approval) of university's Council.

4 Issues and Challenges in cross institutional module sharing

4.1 Access to geographically dispersed knowledge

4.2 Defining a common curricula

4.3 Defining a common assessment criteria

4.4 Language and culture

Teachers speaking the same language and living in the same country are likelier to collaborate, which can inhibit cross-border projects. Culture also can affect teaching methods. In Europe, for example, people in southern countries seem to favor synchronous interactions and working with computers in small groups, while people in northern countries stress individual work. Distance education promotes a common learning culture. This trend aligns with the Bologna process, which seeks to smooth out differences by making courses understandable to all instructors and students through wider use of English. Not all students agree with this. One German-speaking student found: "Sometimes it was difficult because the whole course was in English and that's not my mother tongue. Reading or listening was OK, but writing in English takes getting used to. In general, I had to invest more time." Language and cultural differences can also add value. European initiatives specifically target the development of e-modules promoting language learning by encouraging communication between students and language practice with native-speaker teachers and tutors. Thus, synchronous interactions typically use the native teacher's language, while English might be used in a self-paced mode. Switzerland has three main languages (German, French, and Italian), making the degree of multi-language support, including English, an important criterion in selection of the SVC projects. (Burgi, 2009).

4.5 Technology readiness

Two key technological components enable registered students to access online resources:

A learning management system (LMS)

Associated authentication mechanisms

Given the many learning management and authentication systems available, one can hardly expect to find the same systems among network partners, *particularly* at the consortium level considered here - more than 10 different LMSs have been inventoried in the SVC network. One pragmatic solution is to create public web portals through which students can consult the list of available e-modules and their descriptions, and the URLs to access them directly.

To facilitate searching through e-modules requires a uniform description. The Course Description Metadata (CDM) standard is one such European proposal, which so far has not been widely adopted, perhaps because of the multi-language issue still largely unsolved in such universal descriptions. Moreover, the use of a common standard must take into account that most universities have local applications to manage course administration, and those applications are usually embedded in a central management database. This failure to share course descriptions and technology contributes to problematic curriculum integration of distant courses.

As for student authentication, no solution exists at the European level for LMSs. Consequently, those universities hosting distant courses must provide a URL along with a login, which represents additional administrative workload. In Switzerland, however, this login process is not necessary because all Swiss HEIs (including state hospitals) use a common authentication system (described in "Federated Security")

Besides these technical issues, basic usability (and assistance) should not be neglected. Consider two students reporting difficulties with using files and forums when attending e-modules:

"I don't know why the lectures didn't work properly on my Mac (I had to open the PDF and the RealPlayer file separately and scroll down the PDF myself), but it was not a big problem."

"I also visited the intuitive forums, but I was not able to delete my thread. In my opinion, it should be possible for the user to modify or even delete an unreplied topic."

4.6 Maintaining quality

4.7 Sub heading 7

5 Conclusions & Recommendations

This section will conclude the report and provide recommendations towards cross institutional module sharing.

6 References

Burgi, P.-Y. (2009), "Challenges in Setting Up Cross-Institutional Virtual Campuses", available at: http://www.educause.edu/ero/article/challenges-setting-cross-institutional-virtual-campuses (accessed 18 April 2013)

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