

Gábor ERDEI

Gabriella PUSZTAI

Erika JUHÁSZ

Javier Orozco MESSANA

CAPACITY BUILDING AND DEVELOPMENT IN HIGHER EDUCATION

EDUCATIONAL RESEARCH REPORTS 12.
(OKTATÁSKUTATÓK KÖNYVTÁRA 12.)

SERIES EDITOR

Gabriella PUSZTAI

© AUTHORS, 2021

© CHERD-HUNGARY, 2021

*GÁBOR ERDEI – GABRIELLA PUSZTAI – ERIKA
JUHÁSZ – JAVIER OROZO MESSANA (EDS.)*

**CAPACITY BUILDING AND
DEVELOPMENT IN HIGHER EDUCATION**

CHERD-HUNGARY
2021

CAPACITY BUILDING AND DEVELOPMENT IN HIGHER
EDUCATION



Co-funded by the
Erasmus+ Programme
of the European Union

Editors:

Gábor ERDEI – Gabriella PUSZTAI –
Erika JUHÁSZ – Javier Orozco MESSANA

Reviewer:

Tamás KOZMA

Technical editors:

Krisztina GYŐRI
Ádám BENCZE

Editor:

Educational Research Reports 11.
(Oktatóskutatók Könyvtára 11.)

Series Editor:

Gabriella PUSZTAI

Responsible for editing:

Gabriella PUSZTAI

Published:

Debreceni Egyetem Felsőoktatási Kutató és Fejlesztő Központ
(Center for Higher Education Research and Development, Hungary:
CHERD-H)
4032 Debrecen, Egyetem tér 1. II./202.

ISBN 978-615-6012-11-1 (PDF)
ISBN 978-615-6012-10-4 (ONLINE)
ISSN 2064-9312 (PDF)
ISSN 2732-1800 (ONLINE)

CONTENTS

ADNAN KAN Quality Assurance in Higher Education & PETRA.....	6
GÁBOR ERDEI , DÓRINA TÓTH , ERIKA JUHÁSZ Adult Learning as Capacity Building Activity in PETRA Project	24
RAFIQ NOVRUZOV , NATAVAN BABAYEVA , LEYLA MUSAYEVA Integration of Higher Education Institutions of Azerbaijan into the Standards and Guidelines of European Higher Education Area.....	46
SAMIRA MAMMADOVA Mobility programs in Azerbaijan: current situation and challenges	52
ZEYNALOVA NIGARA, ASLANOVA ZARINAB, AGHABAYLI VUSALA Creativity as a Component of Innovation	56
JUDITH BRÜCKER , DIETMAR PAIER , CORNELIA PANZENBÖCK , JOHANNES WETZINGER Open Access: Significance in Relation to the Science System, EU Programmes and Institutional Implementation.....	63
PIETA SIKSTRÖM , SAANA MEHTÄLÄ , KATI CLEMENTS, TIINA MÄKELÄ, LEENA HILTUNEN, MARJA KANKAANRANTA Digitalization in higher education.....	94
OROZCO-MESSANA, J. , GONZÁLVEZ-PONS, A.M. Towards a Multidisciplinary Education for Engineers	102
ILONA DÓRA DABNEY-FEKETE The Significance of Engagement in Internationalization as Capacity Development in Higher Education.....	113
KRISZTINA GYÖRI Practice of excellence to improve learning and teaching in higher education	127

EDITOR'S INTRODUCTION

The sustainable development of higher education with a wide outreach, requires adequately prepared academics and teamwork. The PETRA Erasmus+ capacity-building project was designed to develop a methodology allowing a quick launch of cooperative Technology Enhanced Learning (TEL) implementation in Azerbaijan contributing to the development of a Higher Education community linking Azerbaijan and Europe for this purpose.

Oil and natural gas exports have helped make Azerbaijan the most prosperous state in the Caucasus region. The post-Soviet Union era was a difficult transition period, which started to flourish after 2003. Economic independence favoured an approach to the EU culminating in the signature of the Bologna Agreement in 2005. The new 2009 education law nominally introduced the European Credit Transfer System in the country. University bachelor degrees are three years, and postgraduate master's programs are two years, followed by PhD and ScD doctoral degrees.

From October 2013, the economic development brought different strategic plans, which aim to bring about a full reform by 2025. The strategy was created in compliance with a holistic and open approach to education and its development, which allowed a higher level of collaboration with the European Union. The strategic goals achieved and presented on this e-book are:

- Content development for a competency-based education, incorporating best practices from the most advanced universities, their key academics, and establishing a Professional Learning Community (PLC).
- Developing this PLC community through the use of pilot academic programs, and experiencing student development and motivation within Azerbaijan's top universities. This will develop a new innovative education system tested on reference development academic programs for the country.
- Qualification of the public policy administration based on state–business partnerships for following stakeholders' guidelines and need.
- Creating a quality driven new mechanism for sustainable higher education development to meet ethics and regulations.

For each contribution the responsible experts during the project have summarized the main achievements and conclusions and they are available to further enquiries.

Javier Orozco Messana

Quality Assurance in Higher Education & PETRA

Adnan Kan¹

Recommended citation:

Kan, A. (2020). Quality Assurance in Higher Education. In G. Erdei, G. Pusztai, E. Juhász & J.O. Messana (Eds.), *Capacity Building and Development in Higher Education* (pp. 5-22). Debrecen, Debrecen University Press.

Abstract

With this study, it is aimed to determine the quality assurance framework within the scope of the PETRA project and to determine the degree of development of the higher education institutions included in the project within this framework. Quality control processes vary according to how quality is defined. There is no defined common accepted definition of quality in higher education. In other words, there is no defined ways how quality is measured and what quality means. Quality framework of PETRA was determined by reviewing the quality assurance literature in Higher education. In order to setting quality goal, strategy and standarts for higher education of Azarbeijan, firstly a quality plan template which included the role of each European partner in the project and the outputs associated with this role was prepared. This template included strategies, objectives, Indicators, initiatives, responsible persons etc. for each project package. To access the quality of the project, the partnership used questionnaires, reports and some forms that developed to record the activities carried out in line with the outputs in the project scope. The results of project are discussed in two parts. In the first part, the trainings implemented by the european partners, the effectiveness of these trainings and the degree of satisfactions of trainees are examined and reported. In the second part, development in the each indicators related with objectives are reported.

Keywords: Quality, Quality Assurance, Higher Education, Quality Plan,

Conceptional Framework

The quality assurance of teaching and learning has become major subject in higher education and higher education politics worldwide. There is no defined common accepted definition of quality in higher education. In other words,

¹ Gazi University, Gazi Education Faculty, Department of Educational Sciences;
adnankan1@yahoo.com

there is no defined ways how quality is measured and what quality means (Harvey & Green, 1993).

According to some of researchers such as Becket & Brookes (2006) quality assurance system in higher education institutions is driven by an increasing global competition for financing and attracting students especially in countries with high student tuition fees.

Quality has a huge and different meanings and its range of meanings cause confusion about the perception of quality. As a result of these confusions quality objectives and perceptions also vary according to stakeholder groups.

According to quality assurance literature at the national and universities level, four main issues addressed: First, no accepted definition of quality exists beyond the acceptance of quality as a relational concept. Second, quality assurance is a complex topic that deals with varying issues at the state and university levels. Third, quality assurance attempts to ensure and enhance the quality of teaching and learning through governance and/or management. And, fourth, the literature on quality assurance of teaching and learning is highly diverse, and the research to some extent blurs the boundaries between research and application. (Steinhardt et al., 2017). Based on Tights (2012) quality assurance is part of the category quality (e.g., course evaluation, grading and outcomes, monitoring practices, and system standards)

Higher education processes and procedures should always be reviewed, examined and critique to improve quality accreditation, public accountability: for standarts achieved, and for effective use of money to contribute to the higher education sector planning process.

Quality assurance is the systematic assessment of organizations or cirriculum in order to determine whether or not educational standarts are met satisfactorily (Hayward, 2001). According to Hayward's definition quality assurance is an integral measure for ensuring standarts are met. In more general point of view, according to Manghani (2011) quality assurance is a quality management measure which guarantees that quality requirements are fulfilled. According to this view quality assurance is an important aspect of maintenance of quality as well as ensuring accountability (Netshifhefhe, Nobongoza & Maphosa, 2016).

Another point of view of quality assurance that could be sutable for higher education is matching between graduate knowledge, skills and values and job market expectations. That kind of view needs to determine the skills gap between what university graduates posses and what employers look for.

Botezatu, Pirnau, & Ciocardia (2019) made definition of quality assurance as the set of pre-established and systematic activities carried out with in the quality system and demonstrated as much as necessary in order to give proper confidence that entity will meet the quality requirements.

Quality Assurance Models

Quality assurance is diverse and multifaceted concept that includes numerous procedure and forms (Aamodt, Frolich, & Stensaker, 2017). There are many theories that related with quality assurance processes and procedures. Quality assurance in education have three wave main paradigm.

The first wave paradigm is internal quality assurance that focuses on improving internal environment and processes such that the effectiveness of learning and teaching can be ensured to achieve planned goals. Internal quality assurance put particular emphasis on the teaching and learning and internal education process. From this point of view, quality assurance focuses on the achievement of planned educational goal and improvement of internal environment and processes in order to ensure effective learning and teaching (Cheng & Townsend, 2000; Cheng, 2003).

The second wave paradigm is interface quality assurance that focuses on ensuring that education services satisfy the needs of stakeholders are accountable to the public.

The third wave paradigm is future quality assurance model that focuses on ensuring the relevance of aims, content, practices, and outcomes of education to the future of new generations in new era of globalization, information, technology, and knowledge-driven economy (Cheng & Townsend, 2000; Cheng, 2003).

Improving Quality Assurance in Teaching and Learning

Ensuring curriculum in higher education has fitness of purpose is very important issue for higher education institutions and quality assurance process. For this reason, if the faculties, departments or programs in any universities want to catch quality in their institution, they should have curriculum committees in order to meet regularly and for the purpose of reviewing programs and courses (Carter at all, 2011). These curriculum committees should be able to make necessary changes in the program, taking into account the societal needs when necessary. This will ensure that the program is compatible with societal needs.

Evaluation of students and teaching staff by their students and peers is also an important internal quality assurance mechanism. Griemel-Fuhrmann & Geyer (2003) argued that this would allow faculty member, teaching staff or lecturer to see their strenghts and weaknesses and provide feedback on lecturer accountability. Such a formative feedback assist the teaching staff to understand what students require from him or her and adopt teaching styles that suit the needs of the students.

Lecturers or faculty members should be observed by their colleagues in terms of special features that students can not observe and evaluate. This is an important quality assurance measure. At the same time Internal and external moderation of assessment activities plays a crucial role in quality assuring

assessment in higher education. Moderation process assists in standardising assessment and ensuring that assessment measures are both reliable and valid (Netshifhefhe, Nobongoza & Maphosa, 2016).

Quality Frame work of PETRA

The Quality Assurance Plan is a management system to help an organization monitor and evaluate the quality of the work produced and describe the quality actions and instruments the project will implement. The Plan is intended to help the manager and all the partners to reach the goals of the project. The quality assurance and evaluation activities that was implemented throughout the project have been designed to: a) Support the coordinator to improve the management of the project; b) Assist the coordinator in evaluating the outputs and relating them to the project objectives specified in the proposal.

Our method to guarantee quality included planning, monitoring and evaluation. Following these measures has enabled us to achieve better results by avoiding deviations from the work plan. It is as well important to refer that following this method makes it possible to adjust all the arrangements needed to get the project on track again in case of some deviations. All partners have an important role in this process; however, each one will have different roles throughout the project development, according to each work package.

Quality studies were conducted on three main teams: general quality, work packages quality and monitoring. In the first team, it is aimed to guide others under the chairmanship of the quality control manager and to monitor and guarantee that the works are done according to the expected plan. The role of the quality manager is to develop the overall project monitoring strategy; to establish requirements and performance expectations; to monitor and assess performance; and proactively to anticipate and resolve issues that impact project success.

Each European partner is also a natural member of the quality control team and is responsible for their work packages. The third team is constituted from all partners engaged in the activities and stakeholders involved by the partnership.

This project QA Plan general statement addressed:

1. Senior management commitment and acknowledgement of ownership for project quality;
2. Commitment to the QA Plan as the mechanism to ensure requirements are met.
3. Commitment to define quality requirements before work starts;
4. Commitment to comply with project quality requirements;
5. Commitment to monitor processes continuously.

The present document seeks to improve quality of the project by:

- Establishing and implementing processes to detect and prevent quality problems;
- Identify, control, and correct items, services, and processes that do not meet established requirements;
- Identify the causes of problems and include prevention of recurrence as a part of corrective action planning;
- Review item characteristics, process implementation, and other quality-related information to identify items, services, and processes needing improvement;
- Effectiveness: the way and degree in which the project achieves objectives;
- Efficiency: the relation between the outcomes and the expenses incurred and resources used during a determinate period;
- Relevance: how project outcomes are useful to solve the defined problems and satisfy the necessities of the beneficiaries.

The value added by a QA Plan present many aspects:

- Feedback and continuous improvement;
- Improved communication;
- Problems prevented initially and/or from recurring;
- Data driven management decisions;
- Improved process performance;
- Intensified focus and resources on issue identification and prevention vs. issue resolution;
- Prompt, decisive steps to correct matters that are out of control;
- Defective actions managed and prevented from getting into processes.

Results and outcomes was evaluated regarding certain aspects:

- Milestones of evaluation (to be done after an activity finished or a product done);
- What should be evaluated in terms of indicators (both quantitative and qualitative indicators);
- Instruments to measure (questionnaires, observation or interviews);
- Monitoring watch actions by answering the question of “Are we making progress to achieve the outputs we aimed to?”.
- deadlines for the evaluation;

Method

Participants and Components of Project

The participants of PETRA Project consist of five European partners and eight Azerbaijani higher education institutes (Universities and representatives of ministry of national education) that are responsible for different work packages and roles. Some important knowledge and explanation about the participants and their role in the project, distribution of work packages, responsibilities is presented in Table 1.

Table 1. The roles and responsibilities of PETRA partners.

Partners University of	Origin	Role in the Project	Brief Descriptions
Valencia	Spain (EU partner)	Management	Management and reporting of Project Process.
Debrecen	Hungary (EU Partner)	Teaching and Learning Methodology	What is the effective teaching and learning methods, instruments and equipments in the higher educations.
Vienna (BFI)	Austria (EU Partner)	Research and Repository	How to organize and implement an effective research and repository.
Jyvaskala	Finland (EU Partner)	Technology	How to use technology in to the teaching and learning in order to increasing effectiveness of Higher education.(Implementing technology in to the effective teaching and learning process)
Gazi	Turkey (EU Partner)	Quality	What is the Quality and quality indicators according to Project aims. How the indicators measured, what kind of instrument used? (Determining, conducting and managing Quality process of Project)
Khazar Azarbeijan Langauage State Pedagogical Azarbeijan Bakü Slavic Sumyagit Ganja State Nahcivan	Azarbeijan Azarbeijan Azarbeijan Azarbeijan Azarbeijan Azarbeijan Ganja Nahcivan	Dissemination Gaining knowledge, skills and experience and implementing	Applying to all experience, skills and knowledge from interaction with EU Partners to their University and Country

Process, Procedures, Implementations and Instrumentations

In order to setting quality goal, strategy and standarts for higher education of Azarbeijan, firstly a quality plan template which included the role of each European partner in the project and the outputs associated with this role was prepared. This template included strategies, objectives, Indicators, initiatives, responsible persons etc. for each project package. Planning represents a number of activities at the design and product development stage, resulting in final product or service quality. The main reasons for quality planning were;

- quality planning makes a decisive decision on institutional, organizational satisfaction,
- quality planning prevents the occurrence of disagreements in the implementation of the product and its use,
- removing disagreements during product quality planning requires only a fraction of the costs we would spend on disaster relief during product implementation and use,
- the correct implementation of quality planning is an important attribute of the organization's competitiveness.
- Some important parts of quality plan and their preperation process is given below by highlighting.

Quality objectives and their selection

Objectives are the main elements of the planning process. They represent the goals to be achieved in a measurable and more specific form. For these reason, six main quality objectives were set by providing information on;

- conformity to legal obligations or organisational requirements,
- fulfilment of needs and expectations,
- the effective and efficient operation of a system or process or implementation of a project.

In the selection of objectives SMART principles was considered. SMART is an acronym that stands for Specific, Measurable, Achievable, Realistic and Time bound. Selected SMART objectives have following characteristics;

- well-defined and focused rather than being too general,
- the results can be assessed qualitatively or quantitatively,
- realistic and achievable,
- consistent with the mission/role/context of the organisation,
- achieved within a defined time period to ensure accountability,
- neither impose extreme workloads on employees, nor require efforts below standard performance.

Measurement of (quality) objectives, setting of indicators

Objectives could be assessed by relating them to certain values that can be measured. These values can either be measures or indicators. Indicators

measure to what extent an objective has been met, and may be associated with implementation of a process, achievement of an outcome, performance or impact of an intervention. Indicators were developed by considering already mentioned SMART principle, because of key and important roles in quality.

Indicators were chosen so that they are appropriate and relevant to the scope and context of the institutions and project, , fits in the way the organisation was managed, and was preferably free from external influencing factors and have had following characteristics;

- simple, clear, easy and feasible to collect without the measurement being too time-consuming or demanding on resources and what to do when the indicator indicates a favourable or unfavourable scenario.
- objective, accurate, useful and unambiguous to interpret.
- reasonable minimum number.

After the quality plan template was prepared by considering already mentioned characteristics, a discussion session was organized with all the European and Azarbeijani partners in order to finalize it. After several discussion sessions, a consensus was reached on the final form of the quality plan template.

In this regard, each of the European partners has been accepted as a natural member of the quality control team and is responsible for designing the activities included in their work packages to serve the goals and outputs included in the quality plan. At the same time The partners were responsible for preparing reports of their work packages for ensuring that the activities are being developed as planned and are fit in the objectives and outputs of the Project as pointed out in quality plan.

Instrumentation

To access the quality of the project, the partnership used questionnaires, reports and some forms that developed to record the activities carried out in line with the outputs in the project scope. In this context, questionnaires have been used to determine the effectiveness of the trainings provided by European partners and satisfaction of trainees (As an example, one of filled questionnaires can be seen at appendix 2). The questionnaires applied to the participants at the end of the each training session.

To measure quality of course, trainings or activities etc. and satisfaction of trainees, a questionnaire with four dimensions was employed, including course specific, activities impact, activities content and instructor specific. Specifically, the first dimension, “course specific”, refers to how well the trainings were organized in general. Second dimension “activities impact refers to whether the course, trainings, events etc have had positive implications on participants or not. The third dimension, “activities content”, refers to questioning of activities content that whether it was effective, useful, understandable etc. or not. The forth dimension “Instructor Specific” refers to how well the material, organization, content etc. presented by the instructor.

A survey has been developed and employed to record developments in the indicators. Survey data on activities related to project outcomes are collected within two academic years (2018 & 2019) following the start of the project. All activities were recorded at the end of each academic year through forms that developed by the quality work packages team (These forms can be seen at appendix 3). Detailed information about the activities carried out was available in these forms. All these forms were developed as an evidence that showing the indicator activities were performed. In addition, these form included detailed information about the activities. At the same time, some materials like participant lists, videos, photographs etc. attached to the form were used as a visual evidence. (The examples of all these visual evidence can be seen at appendix 5)

As almost all outputs of the project are based on the trainings given in interaction with European partners and the activities carried out by Azarbeijsani universities in their own regions, descriptive analyzes were implemented on the collected data and the results were reported accordingly.

Monitoring, evaluation and statistical procedure

Monitoring is one of the key elements of quality. It is regular and ongoing process to collect and analyze information on the functioning of structures and processes or the progress of projects over time. In a timely manner, strenghts and weaknesses could be determined by the monitoring. For this purpose, various surveys and forms developed and data were collected by these tools.

Descriptive statistics were were conducted on these data and according to result of this analysis was quickly and directly fed back to the planning process. In order to reach objectives and improve effectiveness, evaluation was implemented by determining the value and outcomes of activities through systematic, regular research.

Results

The results of project are discussed in two parts in this report. In the first part, the trainings implemented by the european partners, the effectiveness of these trainings and the degree of satisfactions of trainees are examined and reported. In the second part, development in the each indicators related with objectives are reported.

1. Quality and Effectiveness of Activities

At this stage, as a partner, each europeian partners within the scope of the program provided trainings to the participants in their own countries and in Azarbeycan on various dates. These dates and programs is given at Table 2.

In order to assess each of these trainings according to effectiveness and satisfaction of trainees, a questionnaire with four dimensions was employed

including course specific, activities impact, activities content and instructor specific.

Table 2. Training Program for Azarbeijani Partners

Training Subject	Time	Trainer Partner	Training Country
Improving Teaching and Learning Capacity		University of Debrecen	Hungary
Quality Assurance and Teaching and Learning examples, Using Technology in to the teaching (examples), Repository (examples)		Gazi University	Turkey
Developing effective Research and Repository		University of Applied Sciences BFI Vienna	Austria
Using and implementing Technology into the Higher education, establishing moodle etc.		University of Jyvaskala	Finland
Project management			Spain
Research Development Using Technology in Teaching and Learning		University of Applied Sciences BFI Vienna and University of Jyvaskala	Azarbeijan
Improving Teaching and Learning Methods		University of Debrecen	Ganja
Research Development		University of Applied Sciences BFI Vienna	Ganja
Using advanced technology in Teaching and Learning and online consultations of on e-Learning		University of Jyvaskala	Ganja

The items of questionnaire were evaluated using 5 point likert scale. After the end of each trainings, Azarbeijani partners were asked to mark one of the five scale answers on a scale of 1 to 5 (1 refers to strongly dissatisfying 5 refers to strongly satisfying). It is considered that the course or activities Azarbeijani partners took during their trainings might have on effect their views, ability etc.

Since they took several courses related to teaching, research and technological skills and carried out practises on these subject in trainings they might be regarded experienced on the project objectives and strategies.

2. Developments and Improvements in Indicators

The consortium has decided to develop this project motivated by some common objectives. The project is interesting to all partners involved in the partnership in a way or another, which will guarantee the engagement in the project activities proposed.

In the context of each work package, We have identified the following strategy based on the challenges in Azarbeijani Higher education institutions:

- a) Building Human Resources Capacity,
- b) Developing Research Competence,
- c) Improving teaching and Learning Capacity,
- d) Enhancing usage of technology in teaching and learning,
- e) Establishing Long term relationships and long-lasting linkages with European Universities,
- f) Disseminating.

Our goal is to contribute for the resolution of these challenges and reach the objectives through the project development. The challenges defined for this project were identified by using different approaches:

- g) experience gained in the field by partners' institutions from Europe;
- h) by analyzing the literature;
- i) by analyzing the experience acquired by other projects that aim to bridge similar needs; and
- j) analyzing the participation from region & Higher educations; needs analysis.

Strategy 1: Building human research capacity.

Through this strategy, it was aimed to increase teacher capacities by organizing development programs for staff, teachers and trainers. At this stage, as a partner, each country within the scope of the program provided trainings to the participants in their own countries and in Azarbeycan on various subject and dates beyond the project time. In line with the experience and knowledge they gained from these trainings, Azarbeijani universities organized programs, seminars, workshops, trainings etc. under the coordination of the representatives of the project to increase the teacher capacity in their countries.

Various initiatives have been made within the scope of the project in order to implement all these activities and be efficient. First and foremost initiative, functional TLC, fully equipped with technology, was established at each of

Azarbeijani Universities. Study visits and some consortium with members from Azarbeijan was organized for experience sharing and trainings. Lectures, trainings or programs for teachers and staff have been prepared under the guidance of European partners of project

The developments regarding the indicators of the strategy of “building human research capacity” are presented in Table 3.

Table 3. The developments regarding the indicators of the strategy of “building human research capacity”

Strategy	University	Academic Year	Indicators				
			Number and Quality of development program	Number of workshops, seminars, and trainings conducted	Number and quality of teachers trained	Number and quality of staff trained	Number and quality of trainers trained
Building Human Resources Capacity	Azerbaijan Language	2017-18	4	4	60	-	14
		2018-19	8	12	80	20	20
	State Pedagogical	2017-18	2	14	116	60	319
		2018-19	2	10	130	65	300
	Azerbaijan	2017-18	11	4	57	15	4
		2018-19	12	8	40	10	4
	Baku Slavic	2017-18	4	10	120	20	12
		2018-19	5	15	170	30	15
	Ganca State	2017-18	3	4	58	48	10
		2018-19	5	20	220	78	12
	Khazar	2017-18	15	20	70	35	15
		2018-19	20	24	110	50	17
	Nakhchivan State	2017-18	18	64	410	205	59
		2018-19	-	-	-	-	-
	Sumgayit State	2017-18	5	30	150	70	6
		2018-19	7	40	200	80	12

When Table 3 is analyzed, it is observed that all the Azarbeijan partners are active in all indicators related to the strategy of building human research capacity in both 2017/2018 and 2018/2019 academic years. According to the Table, in general, there are significant and respectable increasing at all items (indicators) from beginnig to end of Project. The findings presented in Table 3 reveal that almost all Azarbeijani partners have made significant progress regarding the indicators of the building human capacity strategy.

Strategy 2: Developing Research Competence

It was aimed to develop research opportunities and result, create database of teaching and learning resources and access availability to research information and opportunities of Azarbeijani Universities.

In order to to reach these goals, a series training programs titled how to design an effective research: planning, implementing, reporting etc. have been organized at Austrian partner's country and Azarbeijani Universities. Then All the Azarbeijani Universities implemented all these experiences their countries by organizing trainings, research, publication etc.

Various initiatives have been made at these stage. First of all, experience sharing and training with EU partners was done. After that some initiatives have been made like developing TLC library, web page etc.

The developments regarding the indicators of the strategy of "Developing Research Competence" are presented in Table 4.

Table 4. The developments regarding the indicators of the strategy of "Developing Research Competence"

Strategy	University	Academic Year	Indicators				
			Number and quality of research Works	Number and willingness of instructors to be involved in the research	Number of Res. outcomes	Publication peer Review Journal	Number of Project proposal and signed Project.
Developing Research Competence	Azerbaijan Language	2017-18	179	190	16	160	8
		2018-19	190	200	18	180	10
	State Pedagogical	2017-18	210	3	11	180	15
		2018-19	150	11	0	87	0
	Azerbaijan	2017-18	18	35	4	58	4
		2018-19	0	20	32	10	3
	Baku Slavic	2017-18	8	8	7	2	0
		2018-19	0	0	0	0	0
	Ganja State	2017-18	169	240	25	85	18
		2018-19	186	245	33	213	26
	Khazar	2017-18	60	70	15	152	15
		2018-19	75	85	20	180	20
	Nakhchivan State	2017-18	42	6	6	0	0
		2018-19	200	8	8	0	0
	Sumgayit State	2017-18	108	30	108	80	3
		2018-19	110	110	40	110	5

Table 4 shows that Azarbeijani partners are active in almost all indicators related to the strategy of Developing research competence in both 2017/2018 and 2018/2019 academic years. Despite significant improvements in many indicators, it has been observed that some Azarbeijani universities have not developed enough in terms of repository indicators. This is because it is more difficult and time consuming to reach these indicators during the project.

In general, there are significant and respectable increasing at most of items (indicators) from beginning to end of Project. This findings reveal that all Azarbeijani partners have made significant progress regarding the indicators of the developing research competence strategy.

Strategy 3: Improving Teaching and Learning Capacity

It was aimed Improving Educational Process by using innovative teaching methods and technology in educational process or teaching and learning activities. In addition to the trainings of European partners in both their country and Azerbaijan, technologically equipped TLC was also used to achieve this strategy.

At the same time some initiatives have been made to achieve that goal. One of the most important initiatives was observing and experiencing teaching and learning methods in European Universities.

Strategy 4: Enhancing usage of technology in teaching and learning

It was aimed to Integrate educational technology into teaching and learning and by this way it was intended to improve teaching and learning process. Important initiatives have been made to achieve to this goal. Providing training on using advanced technology in Teaching and Learning and online consultations of on e-Learning by establishing moddle were some of attempts made on that way. Then All the Azarbeijani Universities implemented all these experiences their countries by organizing trainings, research, publication etc.

The developments regarding the indicators of the strategy of “Improving Teaching and Learning Capacity” and “Enhancing usage of technology in teaching and learning” are presented in Table 5.

Table 5 reveal that, Azarbeijani partners are active in almost all indicators related to the strategies of Improving Teaching and Learning Capacity and Enhancing usage of technology in teaching and learning in both 2017/2018 and 2018/2019 academic years. At the same time, in general, there are significant and respectable increasing at all items (indicators) from 2017/2018 academic year to 2018/2019 academic year. This findings reveal that all Azarbeijani partners have made significant progress regarding the both indicators (Improving Teaching and Learning Capacity and Enhancing usage of technology in teaching and learning).

Strategy 5: Establishing Long term relationships and long-lasting linkages with European Universities.

It was aimed to develop International relationship of Azarbeijani Universities and establishing mutual cooperation relationships with European Universities. Important initiatives have been made to achieve to this goal. For this purposes visits and interviews to the Universities in the countries of European partners were organized for Azarbeijani partners.

Partners representing Azarbeiajani Universities visited higher education institutions in the countries of European partners. During this visits, examinations in to the technology centers, laboratories, technological materials using in teaching and learning etc were made in higher education institution and experiences were shared about the teaching and learning methods. In addition they held interviews with some university administrators and some department chairs to establish a forward-looking relationships.

Table 5. The developments regarding the indicators of the strategy of “Improving Teaching and Learning Capacity” and “Enhancing Usage of Technology in Teaching and Learning”

Strategy	University	Academic Year	Indicators		Strategy	Indicators	
			Increased number of students demonstrated higher than average assessment results at each particular university	Number of courses using innovative teaching methods		Number of students using modern technology	Number of teachers using up-to-date technology
Improving teaching and Learning Capacity	Azerbaijan Language	2017-18	1932	15	Enhancing usage of technology in teaching and learning	1700	480
		2018-19	2132	18		1900	520
	State Pedagogical	2017-18	975	14		350	250
		2018-19	1480	14		380	290
	Azerbaijan	2017-18	250	40		900	100
		2018-19	150	50		0	100
	Baku Slavic	2017-18	14	4		150	68
		2018-19	0	0		0	0
	Ganca State	2017-18	520	14		300	180
		2018-19	895	45		800	250
	Khazar	2017-18	650	25		900	150
		2018-19	750	40		1200	170
	Nakhchivan State	2017-18	1020	16		5800	750
		2018-19	3000	18		6000	850
	Sumgayit State	2017-18	149	10		2000	200
		2018-19	160	20		3000	300

Strategy 6: Disseminating.

It was aimed to lead to increased awareness of the research and, therefore, maximize the impact that the research and by this way it was intended to improve Higher education institutions. Some initiatives have been made to achieve to this goal.

For this purposes, number of meetings, conferences and reports from meetings, visits, presentations for media and interested groups were organized.

The developments regarding the indicators of the strategy of “Establishing long term relationships and long-lasting linkages with European” and “Dissemination” are presented in Table 6.

Table 6. The developments regarding the indicators of the strategy of “Establishing long term relationships and long-lasting linkages with European” and “Dissemination”

Strategy	University	Academic Year	Indicators		Strategy	Indicators	
			Number of established relationships	Number of partnership or collaborations with European Universities		Reports from meetings, visits, presentations for media and interested groups.	Number of meetings, conferences about projects
Establishing Long term relationships and long-lasting linkages with European Universities.	Azerbaijan Language	2017-18	20	10	Disseminating	2	3
		2018-19	24	12		5	5
	State Pedagogical	2017-18	31	6		7	7
		2018-19	37	6		11	11
	Azerbaijan	2017-18	5	4		5	8
		2018-19	3	3		6	10
	Baku Slavic	2017-18	4	3		8	5
		2018-19	0	0		0	0
	Ganca State	2017-18	5	10		29	6
		2018-19	31	14		34	16
	Khazar	2017-18	7	20		15	15
		2018-19	10	15		35	15
	Nakhchivan State	2017-18	82	28		12	11
		2018-19	90	32		15	15
	Sumgayit State	2017-18	80	50		9	10
		2018-19	100	65		12	15

Table 6 reveal that, Azarbeijani partners are active in almost all indicators related to the strategies of Establishing long term relationships and long-lasting linkages with European and Dissemination in both 2017/2018 and 2018/2019 academic years. At the same time, in general, there are significant and respectable increasing at all indicators from 2017/2018 academic year to 2018/2019 academic year. This findings reveal that all Azarbeijani partners have made significant progress regarding the both indicators (Improving Teaching and Learning Capacity and Enhancing usage of technology in teaching and learning).

Conclusion

Several conclusion can be derived from the main results of all the activities and indicators of project. According to the questionnaire results, courses, trainings, activities etc. provided within the scope of the project, it is concluded that al the activities are effective. It seems that, all the european partners achieved their responsibilities related with training subjects and work packages.

Azarbeijani partners are active almost in all indicators related to the all strategies in both 2017/2018 and 2018/2019 academic years. In general, there are significant and respectable increasing at all indicators from 2017/2018 academic year to 2018/2019 academic year. This increasing shows that all Azarbeijani partners have made significant progress regarding the indicators.

Despite significant improvements in many indicators, It has been observed that some Azarbeycan universities have not developed enough in terms of some indicators. The reasons for this is that the aid provided to these universities by the EU fund is delayed and it is more difficult and time consuming to reach these indicators during the project.

Because of delay some initiatives (establishing Teaching Learning Center, technology etc.) that was very important in terms of activities expected to be performed by Azarbeijani partners are negatively affected and some indicators may also negatively affected by these situation.

References

- Aamodt, O.P., Frolich, N., & Stensaker, B. (2018). Learning outcomes – a useful tool in quality assurance? Views from academic staff *Studies in Higher Education*, 43(4), 614-624.
- AQAP 2120 Ed. 2 (2009). NATO requirements for deliverable quality plans. Brussels, Belgien, NATO International Staff.
- Becket, N. & Brookes, M. (2006). Evaluating quality management in university departments. *Quality Assurance in Education*. doi:10.1108/09684880610662015.
- Botezatu, M. A., Pirnau, C., & Carp Ciocardia, R. M. (2019). A Modern Quality Assurance System -Condition and Support to an Efficient Management. *TEM Journal*, 8(1), 125-131.

- Carter, J. T., Draugalis, J. R., Bruce S. P., Gonyeau, M. R. (2011). The role of curriculum committees in Pharmacy Education. *American Journal of Pharmaceutical Education*, 75(8), 1-9.
- Cheng, Y. C., & Townsend, T. (2000). Educational change and development in the Asia-Pacific region: Trends and issues. In: T. Townsend, Y. C. Cheng (Eds.): *Educational Change and Development in the Asia-Pacific Region: Challenges for the Future* (pp. 317-344). The Netherlands: Swets and Zeitlinger Publisher.
- Cheng, Y. C. (2003). Quality insurance in education: Internal, interface and future. *Quality Assurance in Education*, 11(4), 202-213.
- Government of Canada – “SMART” objectives and performance indicators. Retrieved from <http://www.tbs-sct.gc.ca/psmfpm/learning-apprentissage/ptm-grt/pmc-dgr/smart-eng.asp>
- Greimel-Fuhrmann, B. & Geyer, A. (2003). Students’ evaluation of teachers and instructional quality-analysis of relevant factors based on empirical evaluation research. *Assessment and Evaluation in Higher Education*, 28(3), 229-238.
- Harvey, L. & Green, D. (1993). Defining quality. *Assessment and Evaluation in Higher Education*, 18(1), 9-34.
- Hayward, F. M. (2001). Glossary: Quality Assurance and Accreditation. Prepared by the Council for Higher Education Accreditation (CHEA) Retrieved from <http://www.chea.org/international/inter_glossary01.html>
- APB Consultan. (2020). Retrieved from <http://isoconsultantpune.com/iso-90012008-quality-management-system/iso-9001-requirements/iso-9001-clause5-4/>
- ISO 10005. (2005). *Quality management systems — Guidelines for quality plans*. Geneva, Switzerland, International Organization for Standardization.
- Jones, P. (2012). What is the difference between a measure and an indicator? Retrieved from <http://www.excitant.co.uk/2012/05/what-is-the-difference-between-a-measure-and-an-indicator>.
- Lennie, J., Tacchi, J., Koirala, B., Wilmore, M. & Skuse, A. (2011). *Equal Access Participatory Monitoring and Evaluation Toolkit*. Definition of key terms. Retrieved from http://betterevaluation.org/sites/default/files/EA_PM%26E_toolkit_front_pages%26introduction_for_publication.pdf
- Manghani, K. (2011). Quality assurance: Importance of systems and standard operating procedures. *Perspectives in Clinical Research*, 2(1) 34-47.
- Mizsztal, A. (2013). Quality planning in various sectors companies. *International May Conference on Strategic Management - IMKSM2013*, 24-26. May 2013, Bor, Serbia.
- Quality planning and Quality objectives. Retrieved from http://www.Scopejointaction.eu/_assets/files/Quality-planning.pdf
- Radovic, M., Camilovic, S., Rakic, Z., Simeunovic, B., Tomasevic, I. & Stojanovic, D. (2012). Process management as basis for quality management in service industry. *Technics Technologies Education Management*, 7 (2) , 608-613.
- Solc, M., Forrai, F., Kliment, J. & Divokova, A. (2017). Process of Quality Planning by the Method APQP. *5th International Virtual Conference on Advanced Scientific Results*.

- Steinhardt, I., Schneiderberg, C., Gotze, N., Baumann, J. & Krücken, G. (2017). Mapping the quality assurance of teaching and learning in higher education: the emergence of a specialty? *Higher Education*, 74, 221-237.
- Tight, M. (2012). *Researching higher education*. New York: McGraw-Hill.



© 2020 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).

Adult Learning as Capacity Building Activity in PETRA Project

Gábor Erdei¹, Dórina Tóth², Erika Juhász³

Recommended citation:

Erdei, G., Tóth, D. & Juhász, E. (2020). Adult Learning as Capacity Building Activity in PETRA Project. In G. Erdei, G. Pusztai, E. Juhász & J.O. Messana (Eds.), *Capacity Building and Development in Higher Education* (pp. 23-40). Debrecen, Debrecen University Press.

Abstract

The elements of capacity development in higher education represent the peculiarities of the globalized, postmodern period: internationalization, the strengthening of the third mission, the strengthening of relations with the economic sphere and the business world. These elements of expansion create, but also require, capacity building, which has become the mainstream concept of the latest modernization period in the world of higher education. Such capacity building has taken place in eight higher education institutions in Azerbaijan. In addition to infrastructural development (creation of Teaching Learning Centers), the cooperating institutions have approximately a group of 35-40 people took part in various one-week trainings organized by the European partner universities. This survey was aimed at teaching and research colleagues from Azerbaijani partner institutions participating in the PETRA project. During the project period, the target group carried out intensive learning activities thanks to intensive trainings and other project meetings. Transformative (developmental) adult education (nowadays more adult learning) is one of the rather important areas and functions of the diverse palette of andragogy. The success of this complex psychological process depends on a number of (external, internal) factors. In our survey, we examined how the target group evaluates the trainings and group work implemented in the project, on the other hand, in a self-reflexive way, what change they perceive in themselves, what the series of trainings contributed to, and professional and personal competence development. In a theoretical approach, we primarily used transformative learning theory to discuss the issue (Brookfield 1985, Mezirow, 1991).

Keywords: capacity building, transformative adult learning, PETRA project

1 University of Debrecen, Institute of Educational Studies and Cultural Management; erdei.gabor@arts.unideb.hu

2 University of Debrecen, University of Debrecen, Institute of Educational Studies and Cultural Management; anna.dorina.toth@gmail.com

3 University of Debrecen, University of Debrecen, Institute of Educational Studies and Cultural Management; juhasz.erika@arts.unideb.hu

Introduction

The elements of capacity development in higher education represent the peculiarities of the globalized, postmodern period: internationalization, the strengthening of the third mission, the strengthening of relations with the economic sphere and the business world. These elements of expansion create, but also require, capacity building, which has become the mainstream concept of the latest modernization period in the world of higher education. Such capacity building has taken place in eight higher education institutions in Azerbaijan. In addition to infrastructural development (creation of Teaching Learning Centers), the cooperating institutions have approximately a group of 35-40 people took part in various one-week trainings organized by the European partner universities. This survey was aimed at teaching and research colleagues from Azerbaijani partner institutions participating in the PETRA project. During the project period, the target group carried out intensive learning activities thanks to intensive trainings and other project meetings. Transformative (developmental) adult education (nowadays more adult learning) is one of the rather important areas and functions of the diverse palette of andragogy. The success of this complex psychological process depends on a number of (external, internal) factors. In our survey, we examined how the target group evaluates the trainings and group work implemented in the project, on the other hand, in a self-reflexive way, what change they perceive in themselves, what the series of trainings contributed to, and professional and personal competence development. In a theoretical approach, we primarily used transformative learning theory to discuss the issue (Brookfield 1985, Mezirow, 1991).

A theoretical approach to the problem - transformative adult learning

The PETRA project is in many respects a complex project, which in our research we approached - naturally - from the higher education side, from several segments of it. Capacity building is a new era in higher education in recent years, in which higher education seeks to adapt to its environment, regional and global challenges, a process that itself changes (Rudner 2009). At the same time, in the turbulent world of the postmodern era, higher education institutions are developing standards that can be used to examine the organizational framework of capacity building well (Stephens 2009, Dill 2000).

One of the very important, if not the most important, professional elements of capacity building in the PETRA project was the one-week trainings, which took place five times (plus the extra trainings). These trainings were organized and conducted by the five European partners on five different professional topics at the headquarters of the respective organizing university. In the present paper, we examine the trainings not from the point of view of higher education, more precisely not only from the point of view of higher education, but also

from an andragogical point of view. In other words, we approach the mentioned trainings as adult learning processes and adult competence development.

There are many areas in the system of functions and objectives of andragogy, which can be similarly interpreted with a number of theoretical approaches. The one-week trainings implemented in the PETRA project can also be placed in the theoretical framework of transformative adult learning, so now we will only take a brief theoretical look.

Transformative learning has a significant tradition in andragogy. In the initial period of the formation of the theory, Paolo Freire, in his approach, considered transformative learning to be the main driver of significant social change. In the process of transformative learning, the individual must be free, without any strong external pressure or divergence, and the individual determines the extent to which he or she accepts the new, how receptive it is again, and what new knowledge is used by future educators, and how they apply them (Freire 1970).

Brookfield, and in particular Mezirow, expanded and deepened Freire's thoughts with the themes of critical thinking, critical self-reflection, and self-directed learning (Mezirow 1991, Brookfield 1985).

Merriam et al., as well as Tennant, also enriched the theory by exploring the possibility of expanding transformative learning toward existing cognitive abilities into new professional fields (Merriam 2007) and examining the relationships between existing required experience, critical reflection, and personality development (Tennant 2006).

Later, in the phenomenon of transformative adult learning, the idea of need-based knowledge acquisition and the implementation of need-based learning that ensured it emerged strongly. The issue of the use of existing knowledge came to the fore, as well as the possibilities of applying new knowledge in different environments (Yee et al. 2019, Giannoukos 2015).

Transformative learning can thus be one of the interpretations of the study of participants in intensive training. At the same time, transformative learning is not an end in itself, as it leads to competence development. In the PETRA project, the development and strengthening of the existing competencies of the participants, the replacement of any missing competencies, the strengthening and development of the existing ones took place. They need to further develop this, even in a self-directed learning way, in the coming period.

The results of the Capacity Building Activities in PETRA Project – main findings of the final survey for WP2

As detailed above, one of the main objectives and activities of the PETRA project was to increase the capacity of the participating Azerbaijani institutions. One area of capacity expansions was the infrastructural design and equipping of TLCs, and another, at least as important element, was the development of the professional knowledge and competencies of the staff

involved in the project and the future TLCs. These developments took place during one-week internships (mobility) with European partners, during trainings held there, and on several other occasions, these trainings continued in various higher education locations in Azerbaijan.

It is necessary to emphasize that the professional areas of the trainings were defined during the formulation of the project, so their implementation was the primary task. At the same time, in the process of competence development, we consider it important to mention three documents that helped the developments and also evaluated the work done so far. At the start of the project, the *Needs analysis of Promoting Excellence in Teaching and Learning (PETRA)* was completed, a mid-term survey (*Questionnaire for supporting the establishment of Teaching and Learning Centers at the partner universities in Azerbaijan*), which specifically targeted the creation of TLCs, and helped design and launch them. The last, evaluative survey (*Staff skills development by the activities of the PETRA Project - evaluations of the activities and the work packages*) evaluated the trainings and professional trips implemented during the project from the side of the Azerbaijani partners participating in it. The latter survey is presented below as a summary of the capacity building professional activity (WP2).

Purpose of the survey

The survey is an evaluation of the trainings, professional sessions and professional trips implemented in the PETRA project, as well as a summary of the competence developments. Capacity building was one of the most important elements of the project, during which, in addition to the development of the physical infrastructure required for the TLCs, the competence development of the personnel operating the TLCs was also essential. In this survey, we examine this by asking colleagues from Azerbaijani institutions participating in competency development trainings and professional trips for evaluation.

Structure of the questionnaire

The online questionnaire consisted of three parts. In the first part (7 questions), the questions took us back to the start of the project, it looked retrospectively at how well they were aware of the project objectives, how clearly the tasks were defined and what Azerbaijani partners had in advance of the project.

In the second part (9 questions), Azerbaijani participants were asked to evaluate project activities, including trainings to develop different skills and competencies.

In the third block of questions (14 questions, plus a text box for other opinions and comments related to the project), we asked about the acquired and existing competencies and skills needed to start, operate and maintain the TLCs established in each institution.

Circumstances of the survey process

The online questionnaire was queried in February and March 2020. Azerbaijani partners have been invited to complete the questionnaire on several occasions. A total of 17 completed questionnaires were received.

We would also like to emphasize before the evaluation that initially 3-3 people from each Azeri higher education institution were typically assigned to participate in various trainings. There were partner institutions where this was held throughout, elsewhere in addition to one or two permanent participants, the other participants changed. We also met one where there was quite a change in the number of people participating in each training, and it also happened that during the project, for some reason, participants dropped out, so new entrants even missed out on several previous trainings and European visits. In this respect, therefore, respondents formed a rather heterogeneous group.

The main findings of the survey

I. At the beginning of the project

Table 1. How well did you know the goals of the project?

Very good	I mostly knew it	I knew a little about it	I did not know it at all
8	4	4	1

Getting to know the goals of the project (identifying with it) is the first and essential step in a project work. Respondents stated that they knew the project very well in detail at the beginning, and were aware of its aims. Nearly a quarter also indicated that they were basically familiar with the development intention, while those who did not participate in the work as a key player but rather as a peripheral, or possibly joined the project team of the given institution due to personal change, did not know or could not know depth of the project.

Q.1.2. In what area(s) did you expect your competence to develop in advance?

When entering a new project or development, the participants have different expectations. With our question, we examined in which areas of competence the Azeri participants had formulated expectations in advance. Based on the responses, we were able to identify the following groups:
 progress in scientific work: „*research methodologies*“, „*international criterias for a scientific article to be published in international journals*“, „*research methodology*“;

development in teaching and learning methodology: „teaching and evaluation strategies”, „teaching and learning”, „how to promote teaching and learning at university”, „teachers training”;

use and application of innovative and ICT tools: „educational technology”, „high-quality forms of teaching using new technological methods”, „some IT competence related to MOODLE”, „to improve the quality of teaching and learning through innovative technology”, „student centered learning mechanism of moodle system”;

personality development: „self development and learning culture”;

gaining experience: „gaining experience”, „teaching and learning experience from European Universities”.

Table 2. The following goals are the aims formulated in the project.

	How interested were the goals for you?							
	Getting knowledge from my field of science	Knowledge of teaching and learning methodologies	Knowledge of research methodologies	Knowledge of science management	Modern teaching techniques and e-learning skills	Knowledge of higher education management	Getting to know the functioning of the European universities	Building professional relationships
Fully interested	6	8	9	3	11	8	13	11
Interested	8	9	4	10	5	8	3	5
A little bit interested	3	-	4	4	1	1	-	1
Not interested at all	-	-	-	-	-	-	1	-

The question, with pre-defined answer options, focused on areas of professional interest. Of the three areas of most interest (getting to know the functioning of European universities, building professional relationship, modern teaching and e-learning skills), the opportunity provided by the

international partnership could in fact provide an answer on its own without being a separate professional field. would have been formulated. Relatively proportionate, balanced responses were received to the other response options offered.

Table 3. To what extent have you participated in the different types of mobilities and trainings in the project?

I was present at every event	I was present at most of the events	I was present at half of the events	I only attended one or two events
4	6	4	3

The question was important not only in terms of respondents' approx. how much of it was able to give an authentic answer (authentic in the sense that it was able to participate in all or most of the trainings, so its answer is based on experience), but also on how much it was able to participate in each competency development training.

Nearly a quarter of respondents attended all events, while almost two-thirds were present at most events. We can talk about the effectiveness of different trainings and professional paths for these two groups. Slightly less than a third indicated that they attended less than half of the trainings, while 3 out of 17 responses indicated that they were present once or twice. In their case, we can talk less about coherent development.

Table 4. How concrete was your role in the project when you started the project?

The expectations were spelled out exactly	I basically knew the expectation of me	I only knew a few details	My role was not formulated at all
5	8	4	-

Given that the project objectives were formulated quite clearly and that the participating Azerbaijani institutions, the colleagues involved in the institutions were informed in advance about the development, it is not surprising that three-quarters of the responses were "accurately aware" or "basically" categories. Slightly less than a third of respondents indicated that they knew only a few details of the project. They may have been the ones who were later involved as the cause of some personal change.

Table 5. How specific was your role in the TLC to be set up at the start of the project?

It was completely concrete	It was quite concrete	Was a little defined	It was not concretized at all
4	8	3	2

In the previous question, we asked about the role of the respondents within the project, but in this request we were curious about the role within the TLC. This is because it was not necessary for everyone involved in the project to be involved in setting up and operating the TLC.

On the one hand, the results were very similar. Nearly a quarter of respondents knew exactly their future job within the future TLC, while nearly 50% also knew broadly about it. Which differs from the answers to the previous question, the answer I don't know at all also appeared here. This was partly due to the fact that the operation of the TLC was not fully developed at the beginning of the project, as these details were clarified during the project process (see: the organizational and operational rules of the TLCs had to be developed during the project process).

Q. 1.7. Which foreign mobility was most professional and why? (Please specify one, maximum two.)

One of the most important elements of the capacity building in the PETRA project was the one-week trainings at European partner universities. These served as competence and skills development activities. In the development, staff skills development was divided into specific, specific areas, and these areas were the responsibility of each European partner. The Valencian partner was responsible for higher education marketing and communication, the Jyväskylä Finnish partner for ICT, partner from Wien was responsible for the scientific research and its methodology, Debrecen partner for capacity development, and the Gazi University in Ankara was responsible for quality assurance in higher education. Delegates from Azerbaijani partner universities (typically three from each institution) took part in the one - week European partner meetings and trainings. In several cases, after these European training weeks, work continued at the Azerbaijani institutions, and on several occasions the European partners traveled to Azerbaijan to continue the trainings they had started for the Azerbaijani partners during their European visit.

Overall, it was positive for Azeri colleagues to experience the trainings held by European partners. Most of the trainings held by the Vienna partner are outstandingly good (due to the compilation of the training material, the conduct of the individual trainings, their professional content, the professional commitment of the trainers). The other trainings also got positive remarks from the Azerbaijani colleagues.

II. Skills and competence development in the project

Table 6. In your opinion, how useful were the following forms of learning at the different project events?

	Traditional performances, lectures	Group work/tasks	Group work/tasks with training methods	Individual tasks	Interactive conversation during breaks and leisure
Fully	3	4	6	2	6
Enough	9	11	8	10	9
A little bit	5	1	3	4	2
Not at all	-	1	-	1	-

The Azerbaijani universities participating in the project increased their human resource capacity mainly through trainings on one-week European professional trips. This competence development was reinforced by the sessions in Azeri locations following the European training weeks in several cases. It can be said that the most popular in the competence development processes for Azerbaijani participants were non-traditional forms (interactive conversations during breaks and leisure, group works / tasks with training methods). The form that was not really useful was the category of traditional performances, lectures, according to the respondents.

Table 7. To what extent have different trainings motivated you to further develop your competences?

	they have been a powerful motivator and I have been developing myself in the field ever since	although I have had positive experience, I have no time to develop myself	they were useful and interesting, but they did not encourage me to further self-education	were not very motivating	I was not motivated at all
Fully	4	-	-	1	1
Enough	11	7	5	2	2
A little bit	2	5	4	4	2
Not at all	-	5	8	10	12

Developing adult competence is a subject in the sciences of andragogy and psychology. Two things are important to emphasize on this topic. On the one hand, adult competency development needs to be approached in a careful way because not all competencies can be developed to the same extent as in childhood or during the young people period. Some are quite well changeable, while others are less so. On the other hand, traditional, formal forms of education can contribute to adult competence development in part (typically at the beginning of the process), while the task can be realized for the most part as an adult self-developmental, self-directed process. The theory of transformative change in adult learning addresses this issue.

The question was how much the trainings for Azeri colleagues motivated the participants to further develop their competencies. As a training is a success if the process started in the session continues and the individual carries out the shaping process motivated and independently. Based on the answers, a basically favorable picture emerges, as the indications appear in the positive ranges. However, responses to the fourth option (*were not very motivating*) nuance this picture.

Table 8. What is your overall assessment of the role of the European project partners in the project?

It was very helpful	It was mostly helpful	Was a little of use	It was not helpful at all
11	6	-	-

In connection with a previous question (which asked about the most useful trainings), we were curious about the summary opinion of the Azerbaijani partners, how useful the partners found the presence of the European partners in the project. In fact, there is no added value from the first approach, as the proposal was submitted jointly with the European partners involved in the project (otherwise it would not have been possible), but the degree of usefulness may be interesting in an evaluation summary. Of the four predefined responses, two did not appear at all among the responses (*it was not helpful at all*, and the *it was a little of use*). Two-thirds of respondents found the presence *very useful*, and one-third said *it was mostly helpful*.

Table 9. What is your overall assessment of the role of each partner in the project?

	Austrian	Finnish	Turkish	Hungarian	Spanish
Was totally helpful	11	5	10	6	6
Was mostly helpful	3	7	7	7	4
Was a little bit helpful	3	5	-	4	6
Was not helpful	-	-	-	-	1

Our question was for Azerbaijani partners to evaluate the role of European partners in the project. The Austrian partner achieved the highest value in the most positive category (*was totally helpful*). Similarly, the Turkish partner received a very positive evaluation so much that it did not represent a negative opinion at all. The Finnish and Hungarian partners received approximately similar evaluations. The Spanish partner had a more difficult situation, as in addition to the WP they cared for, they also took part in project management, and in such a large and complex project, where the administrative, bureaucratic and management cultures were different, management was not easy performing tasks.

Tablet 10. Overall, how do you rate the Azerbaijani partnership in the project?

It was useful and successful in every way	Basically good	Significant problems and difficulties encountered during the project	Azerbaijan cooperation was not successful at all
8	9	-	-

The above analyzes demonstrate the important role that partnership, including international partnership, played in the PETRA project. At the same time, we also examined how the partnership between Azerbaijani partners was implemented, as in the project we are actually facing a network integrating eight higher education institutions from the Azerbaijani side, where cooperation also played an important role.

Of the four predefined responses, two were negative (*significant problems and difficulties were encountered during the project, Azerbaijan cooperation was not successful at all*) had not received any indications. Slightly less than half of the respondents indicated their maximum satisfaction (*it was useful and successful in every way*), and slightly more than half of all respondents considered cooperation between Azerbaijani partners to be *basically good*.

Q. 2.6. In which professional field(s) did you developed most?

Participants were asked to evaluate the effectiveness of the trainings and professional trips that took place. Logically, the professional areas that appeared in each workpackage emerged:

- education technology: „educational technology”, „how to work with MOODLE system”
- teaching and learning methodology: „teacher training”, „teaching with new methods”,
- „understanding, knowing and improving teaching and learning interactively”, „new teaching and learning methodology”, „how to use innovative technology in teaching”

- teacher training: „teacher training”, „interactive learning methods”
- evaluation: „identification of learning outcomes”, „evaluations”
- research methodology: „enhancing research capacity”, „research and innovation competences”, „research skills”
- project management: „managing of projects”
- methodology: „developing documents of Teaching and Learning Centers”, „group work and individual tasks”

Q. 2.7. In which field(s) have you developed the least and why?

The opposite of the previous question appears; that is, how did the participants develop the least? The majority of respondents believe that significant progress has been made in these areas and that the project has achieved its goal (*„I think the project reached its goals for Azerbaijani partners”, „I think I could develop myself in every field”*).

At the same time, several stressed the need for their own continuous development (*„I should develop myself everyday on these fields”*). On the other hand, it seems that some respondents thought that it would have taken even more time to develop and improve different areas of competence (*„I personally think that I am not experienced on that field yet”, „I wish I would learn more about it moodle program”*).

Q. 2.8. What are the professional area(s) in which you are expecting significant development and thus have a feeling of lack?

In this respect, the concept of shortage does not primarily refer to a possible shortcoming related to the project activities, but rather to a general professional shortcoming, expressed independently by the Azerbaijani colleagues, which exists independently of the project (*„educational management and administration”, „communication”, „teaching skills”, „improving the quality of teaching and learning”, „psychology”, „managing science”, „new learning approaches”*).

Table 11. To what extent have you improved during the project in relation to expectations in the following areas?

We can state that the development of the Azerbaijani participants in the listed professional field was typically as expected. In each professional area, most responses came to the *evolved as expected* category, which represents an overall satisfaction.

Based on the responses showing positive values, it can be stated that the strongest developments have taken place in the categories of *managing science, the functioning and world of European higher education and specific professional knowledge*.

	Specific profession al knowledge	Knowledge of teaching methodolog y	Knowledge of research methodolog y	Managin g science	PR and marketin g in higher educatio n	Knowledge e in higher education in general	The functionin g and world of European higher education
I was better than expected	3	2	3	2	1	2	5
Evolved as expected	12	10	8	13	10	10	12
Less progress than expected	2	5	5	1	4	5	1
I did not develope d	-	-	1	1	2	-	-

A few respondents indicated that there was no development at all in the areas of *knowledge of reasearch methodology, managing science, and PR and marketing in higher education*.

III. Teaching and Learning Center

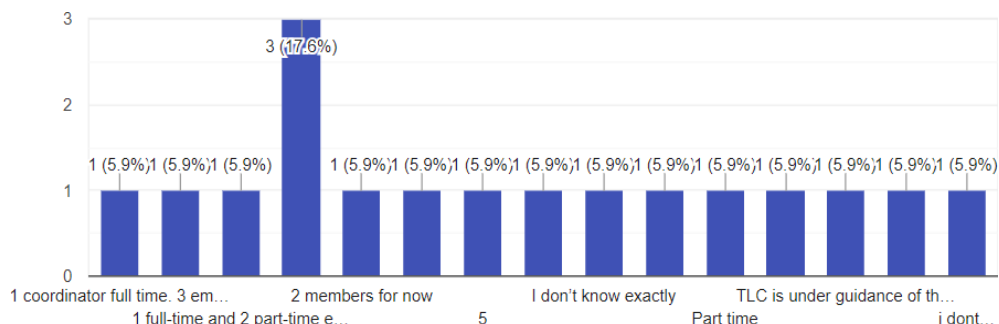
Q. 3.2. If TLC started operation in your institution, when was it started?

The physical design of the Teaching Learning Centers (TLC) was the outcome of one of the most important activities of the project, which consisted of two parts. On the one hand, the real estate design of TLCs is designed to solve the right placement. In this phase, typically existing classrooms, lecture halls, offices were transformed and made suitable, which was often accompanied by construction and renovation works. The second part of the task is to equip the TLCs with the necessary hardware and software. Activities have encountered difficulties on a number of occasions, mainly due to differences in the procedure for procurement in the Erasmus application and local customs, which have led to a slowdown in the procedure and often unsuccessful procurement (or repetition). As a result, TLCs were generated with a significant time difference. In any case, between January 2019 and January 2020, the unit was established in all Azerbaijani higher education institutions participating in the project, so during the survey period (February and March

2020) the TLC was established in all institutions and was already active in several institutions.

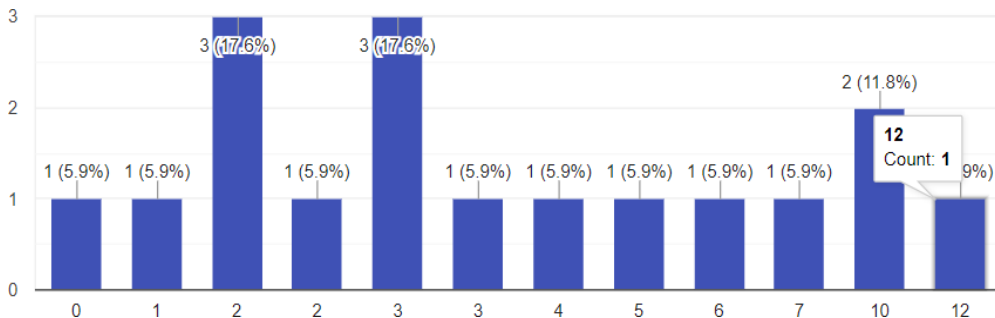
The success of a newly established educational unit depends crucially on the available staff, its qualitative (knowledge, education, skills, acquired competencies, motivation, etc.) and quantitative (headcount) data. Of course, the aforementioned ones may also depend on how agile the given new TLCs articulate their activities (their scope), what programs, trainings, and other services they come up with. But the opposite is also true, the nature and quantity of human resources can set limits on the range of professional activities that can be undertaken.

Figure 1. How many full-time and part-time employees do you have in you TLC?



The higher education institutions surveyed show a rather mixed picture in terms of staff. On the one hand, it is typical for most of them that 1 full-time and 2 part-time employees work in the new TLCs. The other type involves the employment of the two main positions. In the third, only part of the working time is present, in the fourth type it is characteristic that the new TLC has been transferred to another organizational unit.

Figure 2. How many of the current employees (both full-time and part-time) participated in the project?



Although it was previously anticipated that Azerbaijani colleagues involved in project activities would form the staff of the TLCs to be established, we devoted a question to this topic. Apart from a few applications, indeed, project

participants provide the current staff of TLCs, and on the other hand, similarly, nearly 90% of respondents indicated that they had been given some role (managerial, coordinator, professional, trainer, administrator, etc.) in the new unit.

Q.3.5. Do you have a role in TLC now?

Thus, the vast majority of project participants and respondents to the present survey are involved in the operation of the established TLCs. Only two of the 17 respondents indicated that they did not participate in the work of the center.

Q. 3.6. If yes, what is it?

Below we can see the role of the respondents in the established Teaching and Learning Centers. It can be seen from the answers that the respondents fill quite a variety of jobs. *„I design training, prepare content and materials”, „I organize seminars”, „helper”, „organizing of seminars and trainings in TLC”, preparation of the events and trainings, „to develop the status of center, organize workshops”, „I have participated in the development process of TLC and also I take an active part in delivering lectures”, „I give trainings” „coordinating projects”, „I organize seminars and trainings in the TLC”, „member of center”, „to control the TLC and organize the seminars and trainings for teachers and PhD students”, „managing workshops”.*

Q. 3.7. Do you have any information on what role you may play in the TLC you create in the future?

The application material and the project description define the tasks of the created TLCs, which are included in their organizational and operational rules (in each case, the organizational and operational rules of the TLCs had to be developed and adopted by the management of the participating universities). Tasks and responsibilities are defined in these regulations. The established centers would perform the same or very similar tasks, so the jobs and positions would be similar.

However, they can also develop other professional activities, either as an internal service for their own institutions or as an external service for market and economic actors (several institutions have indicated their intention to do so, already in the process of establishing the TLC).

Although the answers seem to indicate that the majority want to perform pre-defined tasks, some centers also want to enter the external market with innovation and creative ideas in the hope of further revenue and self-sufficiency. Some of the following are: *„Content creation”, „organizing seminars”, „I will provide trainings regarding to functioning of the TLC”, „organizing different events for teaching and student staff to understand teaching techniques”, „how to do research”, „involve university management*

in the process actively”, „new learning methodology”, „know-how events and innovative research events”, „member of the management”, „I will be a moderator or the director”, „as Vice-rector coordinating its function and working plan”, „to make relationships with international and local universities”, „trainer”, „training topic proposal”.

Q. 3.8. To what extent can you use your acquired competencies in the professional operation of TLC?

Foreign trainings have significantly contributed to the competence development of Azerbaijani colleagues. We asked respondents what they think will be the extent to which they will use the knowledge and competencies they have acquired.

„I use it to a great extent”, „we may apply everything for teacher and student trainings”, „I use my acquired competencies”, delivering all the competences gained during the seminars at partner universities”, organizing and moderating above mentioned events (E-base, research and innovations)”, we can cooperate with other TLCs of Azerbaijani universities to manage successfully and get good results”, „I have enough capacity to operate TLC”, „in high level”, „to share my experience gained from European partners with other colleagues, to organize meetings”.

Table 12. In your opinion, how much professional staff is available in your institution to operate TLC?

Of the five predefined responses, two negative (*problems are expected, the current staff is not sufficient for successful operation*) were not marked in either case. Predefined, basic tasks will be performed (according to 17.6% of respondents), slightly more than half of the respondents (52.9%) believe that the staff is good. Slightly more than a quarter of the responses (29.4%) stated that the knowledge and motivation of the current staff is a guarantee for successful professional activities.

The knowledge and motivation of the current staff successfully fulfilling the goals	The staff is good	The basic functions are likely to be performed by the staff	Problems are expected	The current staff is not sufficient for successful operations
5	9	3	-	-

Table 13. How important will the following factors be for the operation of TLC?

We have previously examined the characteristics of TLCs staff, their views on how they can perform professional tasks. In this question, we have explored what factors other than staff can affect the operation of TLCs and how important these factors are for the successful operation of TLCs.

	Number of staff	Professional knowledge of staff	Staff motivation	Financial resource	Technical background, tools
Fully	2	12	12	8	10
Rather yes	7	5	4	8	7
A little bit	7	-	1	-	-
Not at all	1	-	-	1	-

Of the five aspects predefined, *professional knowledge of staff* and *staff motivation* stand out. Of these, the other two factors, the *technical background and tools*, and the necessary existence of the *financial resource* are considered to be somewhat less important, but quite similar. Interestingly, respondents consider the number of staff to be the least important.

Table 14. How much does TLC's future success depend on the following factors?

	From the rector/dea n of my higher education institute	From the TLC leade r	From my university 's leaders and colleagues	From TLC employee s	Profession al competenc es of those working at TLC	Motivatio n working at TLC
Fully	9	13	9	6	12	15
Rathe r yes	5	2	7	10	3	2
A little bit	3	2	1	1	2	-
Not at all	-	-	-	-	-	-

The previous question was about operation. This question, in turn, asks for success. That is, the factors that will primarily determine the success of TLCs.

The most important success factor is mentioned by the motivation related to the human side, followed by the head of TLC. This is followed by the professional knowledge and competence of the staff working at the center, and then by the top or faculty management of the given university. Slightly behind this, other managers and colleagues follow, and then the line is closed by the staff working in TLC. That is, summing up the two questions, respondents said TLC staff is very important to perform core tasks, but success can be influenced beyond the existing TLC staff, primarily by different levels of leaders and management.

Table 15. According to your current knowledge, what activities will your TLC carry out primarily?

	Development of teaching methodologies for teachers in higher education	Developing learning methodology for students in higher education	Elaboration of study materials	Conducting internal training	Conducting research and projects	Fulfillment of external training orders	Meeting the needs of the business sector
Fully	12	7	2	9	6	3	1
Rather yes	5	6	11	5	6	8	9
A little bit	-	4	4	3	4	4	4
Not at all	-	-	-	-	1	2	3

The project description includes what professional activities the created TLC will accommodate. At the same time, the implementation of these activities does not preclude the activity profile of TLCs from expanding and evolving in line with internal and external needs. Among the activities, the *development of teaching methodologies for teachers in higher education* was given priority. This was followed by *conducting internal training*, and *developing learning methodology for students in higher education* activities. It can be seen that, as expected, as this is not TLCs' primary mission, the deployment of *fulfillment of external training orders and services to meet the needs of the business sector* is the most uncertain. At the same time, we note that towards the end of the project, several higher education institutions indicated that they would like

to focus on satisfying potential market orders by leveraging the established infrastructure and existing staff, thus generating additional revenue for TLC.

Table 16. According to your experience, previous and current knowledge, what kind of activity will characterize your TLC?

Very strong activity	Strong activity	Low activity	Very low activity
11	6	-	-

Overall, the responses show confidence, as only one person thinks that low activity will be the feature in TLC (the very low activity option was not indicated by anyone). The vast majority assume strong activity and three nominations expect very strong activity from the newly established center.

Q.3.14. Do you think that there is already an established TLC among Azerbaijan project partners that will work very well and could serve as an example for other participating Azerbaijani partners? If so, which one?

It is an international experience that the creation of a new institution, an independent unit in higher education institutions, in their network, runs different careers, which is partly determined by the circumstances of the start. Although each of the institutions involved in the project is committed to setting up and running their own TLC, due to differences in their domestic and even more international experience and professionalism - there may even be significant differences between individual centers. And, of course, everyone is optimistic about the future, but we asked them to name the institution that could be the most model for others. Khazar University was mentioned the most, but each of the Azerbaijani higher education institutions involved in the project was mentioned as an opportunity model for the future. Perhaps more importantly, the partners emphasized the need for cooperation between the TLCs set up and the opportunities they offer.

Q. 3.15. Please write down your opinion on the project, which is not asked by the above questions, but it is important to explain it!

At the end of the questionnaire, Azerbaijani partners were given the opportunity to comment further on the project or to make any other comments that were not asked by the questionnaire. Positive responses were received and instead of summarizing them, we quote some literally.

„Probably future collaboration between partners and TLCs.”

„My opinion is plus.”

„It was a fascinating project with sufficient trainings and seminars.”

„In general, it is successful.”

„It was overall well- organized and the trainers were really responsible and aware of their duties.”

„The project was useful. I have learned much from European universities. I have get acquainted with Moodle platform, also much networking with international and local partners was very useful for me.”

„The overall opinion is quite good. I hope for establishing a long-term partnership with European Universities.”

„The project was very productive.”

Summary

Intensive trainings for the target group were of outstanding importance in the PETRA project as a capacity building project. According to the survey, the one-week trainings in five different professional fields made a significant contribution to the competence development of the participants. Competence development was examined in our present study as adult transformative learning. This theory provided an excellent approach and interpretation for the study of the phenomenon and allows for further analyzes, especially for a self-reflexive approach of the participants' autodidactic processes that will take place later on.

References

- Brookfield, S. (1985). Self-directed learning: A critical review of research. In S. Brookfield (Eds.), Self- directed learning: From theory to practice. New Directions for Continuing Education, 25, (pp. 5-16) Jossey-Bass, San Francisco.
- Dill, D. D. (2000). Capacity building as an instrument of institutional reform: Improving the quality of higher education through academic audits in the UK, New Zealand, Sweden and Hong Kong. Journal of Comparative Policy Analysis: Research and Practice, 2(2), 211-234. |
- Giannoukos, G., Besas, G., Galiropoulos, C. & Hioctour, V. (2015). The Andragogy, the Social Change and the Transformative Learning Educational Approaches in Adult Education. Journal of Education and Practice, 6(10), 46-57.
- Merriam, S. B., Caffarella, R. S. & Baumgartner, L. M. (2007). Learning in adulthood: a comprehensive guide. Josses-Bass, San Francisco.
- Mezirow, J. (1991). Transformative dimensions of adult learning. Jossey-Bass, San Francisco.

- Rudner, M. (2009). Intelligence Studies in Higher Education: Capacity-Building to Meet Societal Demand. *International Journal of Intelligence and Counter Intelligence*, 22(1), 110-130
- Spethens, D. (Eds.) (2009). *Higher Education and International Capacity Building*. Symposium Books, Oxford.
- Tennant, M. (2006). *Psychology and Adult Learning*. Routledge, New York.
- Yee, J., Raimakers, B. & Ischikawa F. (2019). Transformative Learning as Impact in Social Innovation. *Design and Culture*, 11(1), 109-132.

Integration of Higher Education Institutions of Azerbaijan into the Standards and Guildelines of European Higher Education Area.

Rafiq Novruzov¹, Natavan Babayeva², Leyla Musayeva³

Recommended citaiaion:

Novruzov, R., Babayeva, N. & Musayeva (2020). Integration of Higher Education Institutions of Azerbaijan into the Standards and Guildelines of European Higher Education Area. In G. Erdei, G. Pusztai, E. Juhász & J.O. Messina (Eds.), *Capacity Building and Development in Higher Education* (pp. 41-45). Debrecen, Debrecen University Press.

Abstract

This article deals with the analysis of some important reforms and innovations specially on quality and evaluation in teaching and learning implemented in the education sector by the government in Azerbaijan Higher Education Institutions. After gaining the independence, Azerbaijan started successfully to move forward towards the development as an independent country. The country established the close relations with different international organizations and institutions in order to learn the practice of developed countries in education as Azerbaijan didn't have enough resources to make the great changes in education. That is why Azerbaijan got support from various international organizations in order to begin the application of modern education system in our country. As a result, the government of Azerbaijan started the implementation processes of reforms focused on the improvement of the quality of education and development of international relations in the sphere of education in order to integrate to the international standards. The Ministry of Education of Azerbaijan closely collaborates with major international organizations such as: The Council of Europe, UNESCO, World Bank, UNICEF, UNDP, ETF, ISESCO, EU so on.

Keywords: ESG, quality assurance, transparency, stakeholders, internal, external.

¹ Baku Slavic University; rafik_novruzov@mail.ru

² Baku Slavic University; nata_bsu@hotmail.com

³ Baku Slavic University; lmusayeva05@gmail.com

Introduction

In a current world of globalization, education like any other spheres of political, economic and social life with an easier access to universities, the education systems now are expected to provide better quality and meet the demands put forward by external environment, generally reforms and innovations undertaken to improve the quality of education is a thorough process based on multiple and comprehensive approaches to higher education system.

There is a high attention to the development of education in order to secure the country's future sustainable development. In this regard the legislative frameworks to recognize the system of education, as well as reforms in international context, are continuing processes of improvements and innovations.

In 1993, the higher education system of Azerbaijan became a two-tier higher education system consisting of undergraduate education and post-graduate education. Since then, significant reforms have been carried out in the higher education system, as the existing regulations were improved and a credit system was adopted by the higher education institutions.

In 2005 Azerbaijan joined the process made a need to get higher education in the country, meeting the common European standards. Since 2005 reforms are carried out in this direction. One of the most important steps in higher education reform is the adoption of the state program approved by the president. The purpose of this program was the integration of higher education in Azerbaijan to European education space.

Recognizing diplomas' grades in Europe and in other countries is one of the achievements in the education system. The country joined the Bologna system in 2008. One of the main requirements of the Bologna system is the organization of educational process in accordance with the European credit transfer system. Joining the Bologna process has a special role in the reforms in higher education. After launching Bologna system the universities approached this process individually. The introduction of the "Bologna process" in the education system Azerbaijan creates conditions for academic recognition of educational programs inside and outside the country. The system also allows students to continue their education at other universities and thus allows the students increase competitiveness on a labor market. The principle goal of the system of higher education in Azerbaijan is to educate and train highly-skilled specialists in line with the demands of the community and labor market.

At the same time the integration of the higher education system of our country in the European space of the higher education ensuring mutual recognition diplomas and development of students and teaching mobility. At present these rules are of great importance as the adjusting frame document and from the point of view of integration into educational systems of the

European countries. Today each university has its own international relations with other universities in Europe.

In 2009 Azerbaijan government adopted a new law on education after the public debate in the parliament and its implementation started. Reforms in the higher education field are implemented within the cooperation with European institutions, The European Union with European Commission. The new Law “On Education” introduced a three-cycle higher education system (National Report Azerbaijan, 2007). Strategy of the government is to improve HE sector. The President of the Azerbaijan Republic issued an instruction on the preparation on the Development Concept “Azerbaijan-2020 Vision of the Future ” and National Strategy for the Development of Education in the Republic of Azerbaijan.

Research design and methods

Azerbaijan’s education is open to the global reforms. The process of reforms leads to quality transformation. Higher education, research and innovation play a crucial role in supporting social cohesion, economic growth and global competitiveness. Given the desire for European societies to become increasingly knowledge-based, higher education is an essential component of socio-economic and cultural development. At the same time, an increasing demand for skills and competences requires higher education to respond in new ways.

Broader access to Higher education is an opportunity for higher education institutions to make use of increasingly diverse individual experiences. Responding to diversity and growing expectations for higher education requires a fundamental shift in its provision; it requires a more student-centred approach to learning and teaching embracing flexible learning paths and recognising competences gained outside formal curricula. Higher education institutions themselves also become more diverse in their missions mode of educational provision and cooperation, including growth of internationalisation, digital learning and new forms of delivery. The role of quality assurance is crucial in supporting higher education systems and institutions in responding to these changes while ensuring the qualifications achieved by students and their experience of higher education remain at the forefront of institutional missions.

A key goal of the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) is to contribute to the common understanding of quality assurance for learning and teaching across borders and among all stakeholders. They have played and will continue to play an important role in the development of national and institutional quality assurance systems across the European Higher Education Area (EHEA) and cross-border cooperation. Furthermore, the involvement of the students in the decision – making process became average for promoting quality counted overall. Student’s opinion was considered in curriculum design, students are

able to select or reject a course and students' assessment becomes an important part in course and teacher evaluation.

However, the ESG are not standards for quality, nor do they prescribe how the quality assurance processes are implemented, but they provide guidance, covering the areas which are vital for successful quality provision and learning environments in higher education. The ESG should be considered in a broad context that also includes qualifications frameworks, ECTS and diploma supplement that also contribute to promoting the transparency and mutual trust in higher education in the EHEA . The focus of the ESG is on quality assurance related to learning and teaching in higher education, including the learning environment and relevant links to research and innovation. In addition, institutions have policies and processes to ensure and improve the quality of their other activities, such as research and governance. The ESG apply to all higher education offered in the EHEA regardless of the mode of study or place of delivery. Thus, the ESG are also applicable to all higher education including transnational and cross-border provision (Communication from the European Commission: Opening up Education: Innovative teaching and learning for all through new Technologies and Open Educational Resources, 2013).

Higher education aims to fulfill multiple purposes; including preparing students for active citizenship, for their future careers (e.g. contributing to their employability), supporting their personal development, creating a board advanced knowledge base and stimulating research and innovation. Therefore, stakeholders, who may prioritize different purposes, can view quality in higher education differently and quality assurance needs to take into account these different perspectives. Quality, whilst not easy to define, is mainly a result of the interaction between teachers, students and the institutional learning environment. Quality assurance should ensure a learning environment in which the content of programmes, learning opportunities and facilities are fit for purpose.

At the heart of all quality assurance activities are the twin purposes of accountability and enhancement. Taken together, these create trust in the higher education institution s activities (accountability) as well as provide advice and recommendations on how it might improve what it is doing (enhancement). Quality assurance and quality enhancement are thus interrelated. They can support the development of a quality culture that is embraced by all: from the students and academic staff to the institutional leadership and management. Depending on the institution s approach to quality assurance it can, however, refer to the institutions as whole or to any actors within the institution.

The ESG have the following purposes;

- They set a common framework for quality assurance systems for learning and teaching at national and institutional level;

- They enable the assurance and improvement of quality of higher education in the European higher education area;
- They support mutual trust, thus facilitating recognition and mobility within and across national borders;
- They provide information on quality assurance in the EHEA

These purposes provide a framework within which the ESG may be used and implemented in different ways by different institutions, agencies and countries. The EHEA is characterized by its diversity of political systems, higher education systems, socio-cultural and educational traditions, languages, aspirations and expectations. This makes a single monolithic approach to quality and quality assurance in Europe. For these reasons, the ESG need to be at a reasonably generic level in order to ensure that they are applicable to all forms of provision (Council of Europe's Committee of Ministers on the public responsibility for higher education and research, 2007).

The ESG are based on the following four principles for quality assurance in the EHEA:

- Higher education institutions have primary responsibility for the quality of their provision and its assurance;
- Quality assurance responds to the diversity of higher education systems, institutions, programmes and students;
- Quality assurance supports the diversity o a quality culture;
- Quality assurance takes into account the needs and expectations of students, all other stakeholders and society.

Results

Alongside with it, nowadays it would be better to benefit of the programs which are held in our country by the Ministry of Education. As we mentioned above Azerbaijan is open to global reforms especially in education system because education is one of the structures of the government. We have our own institutional ESG system which is held by the ministry of education or by the universities. But it is appreciated to see or observe our results from aside. We can improve this sphere sharing and exchanging ideas, views, opportunities and competences.

References

Communication from the European Commission: Opening up Education: Innovative teaching and learning for all through new Technologies and Open Educational Resources. (2013). Retrieved from http://ec.europa.eu/education/news/doc/openingcom_en.pdf

- Council of Europe's Committee of Ministers on the public responsibility for higher education and research. (2007). Retrieved from http://www.coe.int/t/dg4/highereducation/New/pub_res_En.pdf
- Agencies that Apply for inclusion in the European Quality Assurance Register (EQAR) undergo an external review for which the ESG provide the criteria. Also the European Association for Quality Assurance in Higher Education (ENQA) relies on compliance with the ESG when it comes to granting quality assurance agencies full membership status in the organisation
- Development Concept: "Azerbaijan (2020; Outlook for the Future ". December 29, 2012
- The State Statistical Committee of the Republic of Azerbaijan
State Scholarship Program. Retrieved from [http://xaricdetehsil.edu.gov.az-](http://xaricdetehsil.edu.gov.az-Law on Education. (2009). Retrieved from http://www.azertag.com/store/News/Decrees Orders Laws/ GANUN-TAHSIL% 20 Hagginda.htm)
- Law on Education. (2009). Retrieved from <http://www.azertag.com/store/News/Decrees Orders Laws/ GANUN-TAHSIL% 20 Hagginda.htm>
- Tempus Office in Azerbaijan. Retrieved from [http://www.tempus-az.org-National National Report Azerbaijan. \(2007\). Retrieved from http://www.ond.viaanderen.be/hogeronderwis/bologna/links/National-reports-2007//](http://www.tempus-az.org-National National Report Azerbaijan. (2007). Retrieved from http://www.ond.viaanderen.be/hogeronderwis/bologna/links/National-reports-2007//)
- Ministry of Education of the Republic of Azerbaijan. (2020). Retrieved from <http://edu.gov.az->
- Mikailova, U. & Radsy., V. (2013). School Leadership in Azerbaijani early childhood education: implications for education transfer. *Center for Innovations for Education Azerbaijan*, 193-211.
- Seyidov, S., (2011). Reforms In Education International Integration: The Case of Azerbaijan,
- The European Education Directory. Retrieved from <http://www.euroeducation.net/prof/azerco.htm->



© 2020 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).

Mobility programs in Azerbaijan: current situation and challenges

Samira Mammadova¹

Recommended citation:

Mammadova, S. (2020). Mobility programs in Azerbaijan: current situation and challenges. In G. Erdei, G. Pusztai, E. Juhász & J.O. Messina (Eds.), *Capacity Building and Development in Higher Education* (pp. 46-48). Debrecen, Debrecen University Press.

Abstract

The article is based on motilities that granted by the European Commission. Mobility plays an important role to the development of educational and cultural relations of universities. Mobility give an opportunity to gain EU experience and to share it in his/her own country among the staff members and class mates. Mobility programs give us a great opportunity for learning and making friendship and establishing of cooperation. If we review the history of mobility programs we can see huge numbers of mobility names and dates. ERASMUS MUNDUS, ELECTRA, ERASMUS HUMERIA, ERASMUS KA 1 and International Credit Mobility programs. When we researched this topic we came to the conclusion that still we have some problems. Some universities especially from regions have challenges to implement mobility programs. We tried to identify the problems and present solution ways for them.

Keywords: mobility, education, internationalization, EU, Eastern partnership, ERASMUS+

Introduction

Eastern Partnership (EaP) was a productive program for Azerbaijan. This was hailed by both sides as a success in bilateral relations. Another success story is mobility. In 2013–2014, Baku signed visa facilitation and readmission agreements, a Mobility Partnership, and increased cooperation with Frontex (“The Eastern Partnership: the view from Azerbaijan” Posted on June 16, 2015 by admincascade)

The Erasmus+ programme is the EU’s funding programme for education, training, youth and sport between 2014 and 2020. Set to last until 2020, Erasmus+ doesn't just have opportunities for students. Merging seven prior

¹ Sumgayit State University; baku_2007@mail.ru

programmes, it has opportunities for a wide variety of individuals and organizations. The aim of Erasmus+ is to contribute to the Europe 2020 strategy for growth, jobs, social equity and inclusion, as well as the aims of ET2020, the EU's strategic framework for education and training. Erasmus+ also aims to promote the sustainable development of its partners in the field of higher education, and contribute to achieving the objectives of the EU Youth Strategy.

Specific issues tackled by the programme include:

- Reducing unemployment, especially among young people
- Promoting adult learning, especially for new skills and skills required by the labour market.
- Encouraging young people to take part in European democracy
- Supporting innovation, cooperation and reform
- Reducing early school leaving
- Promoting cooperation and mobility with the EU's partner countries

International conference on “Mobility Partnership in Azerbaijan” was held in Azerbaijan (Baku city) supported by the European Commission, Ministry of Foreign Affairs of the Republic of Azerbaijan and the International Centre for Migration Policy Development (ICMPD). EU Ambassador to Azerbaijan Malena Mard, Deputy Foreign Minister Mahmud Mammadgulyev, representatives of diplomatic missions of EU countries accredited in Azerbaijan. She mentioned that the project mobilize is an example of the close and mutually beneficial cooperation between the parties. Mammadgulyev, in turn, mentioned that Azerbaijan is interested in cooperation in the field of mobility with the European Union (Mobility Partnership Conference, 2016).

The conference continued with the discussion of the conference participants. The practice shows that such kind of conferences play a valuable role for discussing on current situation, problems and perspectives for the future in this direction.

EU grant especially play an important role in the development of educational relations and implementation of motilities. One of the trends in education is mobility. There are many partnership agreement had been signed within international projects financed by EU. They are:

Specific bi-lateral co-operation activities between the Council of Europe and the Ministry of Youth and Sports of the Republic of Azerbaijan were included for the first time in the Council of Europe Action Plan for Azerbaijan for 2016-2017. They are grouped under the project Capacity Building of Youth Leaders and Activists from Azerbaijan, Human Rights Education and Democratic Citizenship.

Method: It was used the comparative and critical methods during the paper designing process.

Result: After collecting the date on mobility the result was good. But it is not mean that excellent. Mobility programs are useful and flexible for capital

universities. Among other findings, the statistics show that in its first year, Erasmus+ supported over 650,000 people to study, train or volunteer abroad! Erasmus+ is the EU's programme to support education, training, youth and sport in Europe. Its budget of €14.7 billion will provide opportunities for over 4 million Europeans to study, train, and gain experience abroad. We hope this numbers for Azerbaijan also will increase in the nearest future.

Conclusion: participation in ERASMUS+KA 2 projects is more easy than KA 1 ICM programs for regional universities in Azerbaijan. Lankaran State University, Ganja Technological University, Sumgayit State University can be such examples. Question why? And how to solve this situation we rewied above in the article. So, the causes are:

- Not having education programs based in EU standards. Integration of education programs to EU is important;
- Not having syllabuses based on EU standards;
- Major of students coming from villages (Their parents do not allow them to go and study or attend in mobility);
- Mentality issues. Most of girls are married. They do not have permission from their husband. The husbands do not support them;
- Girls' pregnant situation. They prefer to make family and child than take part in mobility programs.
- Problems in legislation. Boys should be in military service. Boy with higher education diploma serves 1 year, but who has not higher education diploma have to serve 1 year 6 month. As we see 6 additional months. If the boy student participates in mobility he will get diploma one year late. At the same time due his age he should serve in Military service. As he could not present his diploma he had to serve 6 months in addition.

Recently, projects supported by the Education Ministry of Azerbaijan Republic are implemented in Azerbaijan. TWINING "Support to the Ministry of Education of the Republic of Azerbaijan for Further Adherence of the Higher Education System to the European Higher Education Area" project, ERASMUS+EQAC "Establishment and development of Quality Assurance Centers in Azerbaijan universities" project can be a good example. Pilot educational programs, pilot subjects are selected and they are modernized and integrated into EU standards. The objectives of the project are recommendations regarding legislation relevant Quality Assurance, to gain EU good practice and experience in quality in education sphere.

Standards and Guidelines for Quality Assurance in Higher Education in Azerbaijan are developed Higher Education Institutions (Support to the Ministry of Education of the Republic of Azerbaijan for Further Adherence of the Higher Education System to the European Higher Education Area, 2020).

Taking up the wider objectives of Establishing and improving the Quality Assurance Centers in Azerbaijan HEIs, the project (EQAC) will support the

exchange of knowledge and experience by increasing the exposure of the universities to European education standards, ESG.. (EQAC, 2020).

“State Program for Increasing the International Competitiveness of Higher Education System in the Republic of Azerbaijan for 2019-2023” approved by the Order of the President of the Republic of Azerbaijan No.711. As we see the internationalization is one of the priorities in Azerbaijan. However those are top priorities of the Republic of Azerbaijan which was explicitly indicated in the Development Concept “Azerbaijan - 2020: the vision of the future” approved in 2012 by the President of the Republic of Azerbaijan. The State Strategy on Education Development of 2013 and its Action Plan translates the tasks reflected within the Goal 4 of the SDGs to the national policy level.

References

- Schiller, F. (2016). Migration, Mobile Goods and Trade Networks in the Caucasus. Humanites and Social Sciences Online. Retrieved from <http://dwurl.hu/HSyaJW>
- Council of Europe Action Plan for Azerbaijan for 2016-2017. (2016).
- Alieva L. (2015). The Eastern Partnership: the view from Azerbaijan. European Council for Foreign Relations. Retrieved from <http://dwurl.hu/ABtkLq>
- Mobility Partnership Conference. (2016. june 23.). Azerbaijan
- Meeting on the Strategic Development plan of Sumgayit State University. (2020). Retrieved from <http://dwurl.hu/zjfMBA>
- Support to the Ministry of Education of the Republic of Azerbaijan for Further Adherence of the Higher Education System to the European Higher Education Area. (2020). *Twining*. Retrieved from <http://eha.edu.az/en/objectives>
- Establishment and Development of Quality Assurance Centers in Azerbaijan Universities (2020). Retrieved from <http://eqac.az/en/content>

Creativity as a Component of Innovation

Zeynalova Nigara¹, Aslanova Zarinab², Aghabayli Vusala³

Recommended citation:

Nigara, Z., Zarinab, A. & Vusala, A. (2020). Creativity as a Component of Innovation. In G. Erdei, G. Pusztai, E. Juhász & J.O. Messana (Eds.), *Capacity Building and Development in Higher Education* (pp. 49-54). Debrecen, Debrecen University Press.

Abstract

The presented article deals with the development of students' creativity in higher education and importance of the skills for the modern world. Different theories and ideas regarding creativity are compared and various forms of synthesis are suggested to optimize the development of creativity.

Keywords: creativity, innovation, learning proses, talent

Introduction

Dynamic economic changes in modern world give the reason for development and the importance of creativity. The progress of job market enables business and organizations to take advantage of creativity and to implement innovations.

Undoubtedly, continuation of the process through this way, reforms, drastic changes and dissemination of new approaches in the education system have set important tasks for the educational institutions and their academic staff. The main task for a higher education institution is to provide the society with high-class professionals who can make quick decisions. For this reason, promotion of creative potential of the most dynamic part of the society-students- at higher institutions, in general, is possible.

The term "creativity" is generally used alongside with innovation. These two complementary terms are of particular importance in the teaching of all disciplines, mainly in the training of pedagogical personnel and teaching pedagogical modules.

Innovation and its association with creativity

What is innovation and what does it have to do with creativity? Innovation, in its broadest field, is a modern notion, a fact, a new, different and original

¹ Azerbaijan University of Languages; nigarzeynalova777@gmail.com

² Azerbaijan University of Languages;

³ Azerbaijan University of Languages; vusala_adu@rambler.ru

approach to events, and ultimately a product valued by everyone. Innovations always require diligence, perseverance, and endurance, since implementing and realizing good ideas is very hard and durable process. Ideas about creativity and innovation change, develop and expand over time.

However, at the beginning of the 21st century, creativity was regarded as an internal and inborn characteristic of a person and was attributed to Arts only. Years later it began to cover all disciplines. Today it is regarded as the solution of the problems and cooperation process as well. For instance, Confucius and his supporters considered creativity a collective activity, which did not belong to individuals, but rather to social groups. Here, unlike Western culture, individuals are not tempted to stand out of the class.

Creativity is an active process, which is considered to be an important and central part of innovations. Besides gaining skills, it is a way of training which requires an understanding of the special meaning. According to Campulis and Berky (2014), "Creative thinking means students putting their imagination in order to create new ideas, experimenting their hypothesis, working with alternatives, evaluate their own and their peers' ideas, products, and processes". Creative thinking is looking at the same thing at the same time, but thinking differently. Kaufman and Beghetto (2009) have developed four categories that allow identifying differences in levels and types of creativity. In the given table below we can see the different types of creativity and their definitions.

Table 1. Types of Creativity.

High creativity	This type of creativity is a distinctive feature of a limited number of people who are radically changing the subject into a new form and shape. Though their activity is controversial and arguable, they are considered innovative. Darwin's "Evolution" and Einstein's "Relativity" are good examples of this. Creations of those who are creative are extraordinary, like themselves.
Procreativity	This type of creativity requires critical attempts and effort for time and development. A person who shows special interest in music in childhood gains experience and skills after a certain period of time and procreativity shows up.
Low creativity	Craft has included "people who exhibit mastery, agility, and innovation in daily activities" to this category (Craft, 2005, page 43). This creativity belongs to those who face complex problems throughout work, and who solve them masterfully. To ensure this learning level of the learners it is necessary to involve them in targeted practical activities within the subject. This means that low creativity is based on experience. Environment is considered to be a vital factor for succeeding at this level. Properly planned process results in the creation of a new product bearing "originality and deep meaning" (Richards, 2007, page 5)
Mini creativity	Mini-creativity is a "special new and detailed explanation of the action, the event and the experience" (Kaufman and Beghetto, 2007, page 73). This category can sometimes be neglected by other people. Though, it is possible to form this any time. This type of creativity can be developed by teachers and parents. Mini-creativity occurs when a person demonstrates "agility, consciousness, innovation" (Kraft, 2005, page19). Learners demonstrate a different approach to the problem in this category and link existing knowledge with new information.

Our research proves that there is no rigid border between the levels of the categories suggested by the authors and can be transformed into one another. Moreover, these categories do not apply to specific age levels.

Analysis on H. Gardener's theory

Low creativity and mini creativity are the ones which can be developed in the learning process. The activity they form does not focus on radical innovations that change the world, but rather informs creative and innovative approach towards facts and events, and personal development through inner intuition. It is possible for a person to manifest himself in several categories in various fields and to reveal his potential. H. Gardner's theory of multiple intelligences proves this idea (multiple intelligences is used as cognition in some literature). According to this approach, human intelligence combines different types that are not dependent on one another. Gardner differentiates 8 various types of intelligence (talent). They have a close relationship and can be used together or independently in the learning process. Here, "general" creativity evolves into "special" creativity (Appendix: Gardner's table).

1. Verbal-linguistic intelligence. This type of person likes to read, has good oral and verbal memory, has an extensive vocabulary with a rich lexical background, and tends to lie.
2. Logical-mathematical intelligence. This type of person examines categories and structures through manipulation of objects, characters, and concepts, likes mathematical calculations and operations and solving logical issues, loves chess, thinks at an abstract level compared with his peers, and understands cause-result relationships.
3. Visual-spatial intelligence is dependent on sense and visual perception, skills to see objects through eyes and imagine. This type of person has the ability to create internal mental images and icons.
4. Bodily-kinesthetic intelligence is directly related to the cerebral cortex that reacts the body's muscular movements. This type of person likes to disassemble items, re-gather and combine their parts, details, and elements, to run, jump, touch the items around them with hands, and demonstrate their professional abilities.
5. A person who has musical-rhythmic intelligence remembers music melodies, gladly performs musical instruments, can sing in choir or solo, likes to create rhythm on the table, and likes to hum during any activity.
6. Interpersonal intelligence mainly appears during communication. Cooperating in teams and inclining to verbal and non-verbal communication are characteristics of this type.
7. The person who has intrapersonal intelligence demonstrates his independence, will, and endurance, defines his own weaknesses and strengths, is able to psychologically regulate himself, prefers to work on his own and stands out with a high degree of merit.

8. Naturalistic intelligence. This type of person is particularly interested in natural phenomena, flora and fauna, tries to perceive them, distinguishes the features and properties of the environment, and can analyze and organize his thoughts.

Gardner claimed that the more a person employs a type of intelligence, the higher learning outcomes he gets. Although the types of intelligence mentioned above are interconnected, each one can be further developed independently.

Using the theory of multiple intelligences in the learning process facilitates use and activation of the diversity of learners' personal characteristics and creation of many opportunities for learning. Based on the theory of H. Gardner, it is possible to discover students' talents in the learning process and develop creativity in them. A comparative analysis of Gardner's theory with categories suggested by Kaufman and Beghetto, the proper organization of the learning process directly stimulates the development of creativity and allows progress at some level, regardless their individual characteristics.

Creativity and innovation in the learning process are dependent on a number of factors. It requires reflection and stimulation of activity and entails the formation of features such as self-confidence and responsibility. The inclination to creativity is one of the main factors of a full and meaningful life and is highly appreciated in higher education and labor market. Developing an individual's creative potential has a positive impact on physical and psychological health, creates tolerance against difficulties, reduces aggressiveness, and fills with patience (Richards, 2007).

Creative, lateral (new point of view at facts and events) and linear thinking (use of existing way of thinking), imagination, interest in exploring the problem, exploring and drawing conclusions are indispensable qualities to understand new concepts and perspectives. The learner understands the knowledge that he has mastered in a better way in the discussion process, as well as in the debates by exchanging views. It will help the learners in the future to display their personal way of thinking, reflect their views independently and reason. "If a person does not possess the certain knowledge to think creatively, he cannot think creatively. Creativity is the balance between knowledge and freedom out of it" (Johnson-Laird, Sternberg, 2012).

Comparison of Taxonomy of Cognition

Currently, the organization of learning process in the world is based on Bloom's "Taxonomy of learning objectives" created in 1956. A number of legal-normative documents have been accepted within the education reform program in the Republic of Azerbaijan. According to this document, Azerbaijani education should integrate into European education and comply with European standards. For this very reason, Bloom's taxonomy is especially used in our education. It creates extensive opportunities for planning and

differentiating learning. The rapid scientific progress of 20th century has made preparing new variations of Bloom's taxonomy inevitable. In 2001 American scientists L. Anderson and D. Kraswohl (2002) proposed the updated and more improved model of Bloom's Taxonomy of Cognition.

Figure 1. Comparison of Taxonomy of Cognition by B.Bloom (1956)

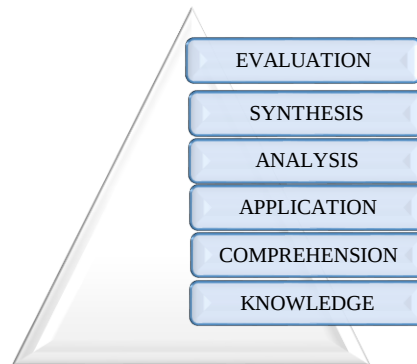
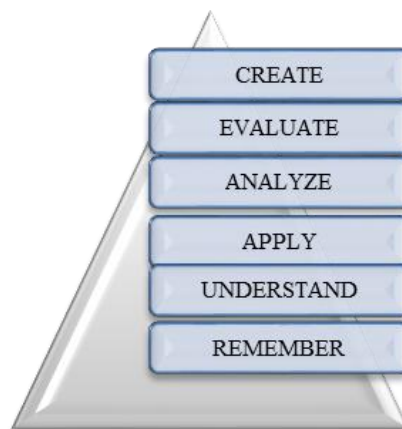


Figure 2. Comparison of Taxonomy of Cognition by L.Anderson and D. Kraswohl (2001)



Taxonomy has six levels. First three levels comply with general learning, and help to form low-level skills, and incorporates limited knowledge and skills on the subject. The other three comply with deeper learning and help to form higher level skills. Contrary to general learning, it provides a comprehensive and wide study of any topic, its interpretation, evaluation, and application in a wide range. In a new version of taxonomy, “create”-creativity happens at a later stage after evaluation as a high level of thinking. Looking at each level of taxonomy separately, it is possible to creatively prepare the tasks for the “remember” stage. Thus, at this stage using brain maps provides creativity, and strongly stimulates remembrance of the information.

Conclusion

Materials presented for improving the creativity of students need to be chosen or prepared carefully because it plays a critical role in the creative activity. Factors affecting the development of creativity include evaluation, stimulation, and motivation of students. Organization of the activity in this way entails the formation of basic competencies in students, along with the development of creativity.

Creative training activities are closely intertwined with others like L. Vigotski's "zone of proximal development" and teacher's scaffolding-support strategy. Cultural sensitivity has special importance in this regard. If creative habits and skills are not formed in the students, they should be guided in completing their respective assignments and be supported by the teacher. Creative activities should be directly linked to learning objectives, and teachers and students should be thoroughly informed about it. Çikçentmixali (2002) emphasized the positive impact of the use of gaming technologies in teaching science on the development of creativity. According to him, the use of games in the training process increases the creative thinking skills by several times. Below are some of the features that affect students' individuality, motivation, and self-confidence, as well as training habits that promote creativity:

- Strengthen tolerance to uncertainty and solving problems with determination
- No fear of making mistakes and learning from them
- Not judging in the process of gathering ideas
- Ready to take sound risks when required

Within creative learning process students need to present some skills:

- Clarify, uncover and redefine the problem question
- Ask rational questions
- Identify the relationships among issues that are not evident at first glance
- Asking questions like "How can it be improved?"
- Identifying alternative opportunities
- Looking at facts and events from different aspects

The creative learning process usually requires the development of self-management skills and proves itself in ideas related to reflection and metacognition. Because of this reason, the below-mentioned points should be born in mind:

- Identifying strengths and weaknesses of the individual
- Analyzing different strategies and approaches regarding the problem and systematize results
- Planning the choice of the approach
- Monitoring activity and changing the approach, when needed
- A critical approach to different parts of the work, if required

Development of student creativity ought to be the main objective of a teacher's activity in the modern world. The teacher should analyze different approaches

and theories, refer to them in the learning process, and organize the lesson creatively.

Taking into account the above-mentioned small nuances in the learning process will pave the way for students to build creativity and to work competitively in the labor market in the future.

References

- Beghetto, R. A. & Kaufman J. C. (2007). Toward a broader conception of creativity: A case for mini-c creativity. *Psychology of Aesthetics, Creativity and the Arts*, 1, 73-79.
- Craft, A. (2005). *Creativity in Schools. Tensions and Dilemmas*. UK: Routledge.
- Garner, H. (1993). *Multiple Intelligences*. New Horizons in Theory and Practice
- Kampylis, P. & Berki, E. (2014). Nurturing creative thinking. *Educational Practice Series*, 25, 6. Retrieved from <http://unesdoc.unesco.org/images/0022/002276/227680e.pdf>
- Kaufman, J. C. & Beghetto, R. A. (2009). Beyond Big and Little: The Four C Model of Creativity. *Review of General Psychology*, 13(1) 1-12.
- Krathwohl, D. R. (2002). A revision of Bloom's taxonomy: An Overview. *Theory into Practice*, 41(4) 212-218.
- Richards, R. (Eds). (2007). *Everyday creativity and new views of human nature: Psychological, social, and spiritual perspectives*. Washington, DC.
- Sternberg, R. J. (2012). The Assessment of Creativity: An Investment-based Approach. *Creativity Research Journal*, 24(1), 3-12.
- Vygotsky, L. S. (1967). Play and Its Role in the Mental Development of the Child. *Soviet Psychology*, 5(3), 6-18.

Open Access: Significance in Relation to the Science System, EU Programmes and Institutional Implementation

Judith Brücker¹, Dietmar Paier², Cornelia Panzenböck³, Johannes Wetzinger⁴

Recommended citation:

Brücker, J., Paier, D., Panzenböck, C. & Wetzinger, J. (2020). Open Access: Significance in Relation to the Science System, EU Programmes and Institutional Implementation. In G. Erdei, G. Pusztai, E. Juhász & J.O. Messina (Eds.), *Capacity Building and Development in Higher Education* (pp. 55-78). Debrecen, Debrecen University Press.

Abstract

This paper addresses the challenges to universities which are emerging from the growing demand for providing open access to data and research results, in several ways. It provides a discussion of the scientific principles of open access and outlines the key characteristics of implementing open access in the European Research Area (ERA) and the Erasmus+ programme. The practical challenges emerging for universities in implementing open access are then laid out, with a special focus on institutional approaches to implementing open access, its financial requirements and legal implications, as well as the necessary infrastructure and resources. The main challenges for universities in implementing open access are summarised in the concluding section.

Keywords: open access; science system; EU funding programmes; institutional implementation

Introduction⁵

Demands for open access to research results have been gaining increasing attention in scholarly and public debates in recent years. This paper looks at the topic of open access, examining it on three levels. Firstly, there is a discussion of the significance of open access for the science system, in which

¹ University of Applied Sciences BFI Vienna; judith.bruecker@fh-vie.ac.at

² University of Applied Sciences BFI Vienna; dietmar.paier@fh-vie.ac.at

³ University of Applied Sciences BFI Vienna; cornelia.panzenboeck@fh-vie.ac.at

⁴ University of Applied Sciences BFI Vienna; johannes.wetzinger@fh-vie.ac.at

⁵ This article was first published in "Wirtschaft und Management", Nr. 28, July 2020.

we put open access into the context of evolving models of the science system as well as science policy. This is then used as the basis for an analysis of how open access has been taken up in major European Union (EU) funding programmes in the areas of research and higher education. Linked to this, we provide a review of the concrete open access requirements and policies of the recent framework programmes for research and the Erasmus+ programme. The paper goes on to evaluate the implementation of open access at the level of higher education institutions. Key aspects which need to be considered for this institutional implementation are introduced here – ranging from legal and financial issues to infrastructure and resources. Finally, conclusions on key findings are drawn and there is a summary of the challenges that universities and individual researchers face when implementing open access.

Open science and open access

Open science and open access have been attracting increasing attention in science and politics. Both principles are closely intertwined, and represent inherent characteristics of scientific practice:

“Open inquiry is at the heart of the scientific enterprise. Publication of scientific theories – and of the experimental and observational data on which they are based – permits others to identify errors, to support, reject or refine theories and to reuse data for further understanding and knowledge. Science’s powerful capacity for self-correction comes from this openness to scrutiny and challenge.” (The Royal Society, 2012 p. 7)

This statement reveals that openness is also a key feature of self-regulation of science. Scientific progress is a result of the science system’s capacity for rigorous and organised evaluation and criticism of theories, data and methods. Openness is therefore a key principle of academic socialisation and a fundamental value which guides both the behaviour of individual scientists and the science system’s interaction with other scientific and non-scientific institutions.

Alignment of scientific activities to the principles of open science and open access cannot be taken for granted, however, as there are a number of developments which require continuous redefinition of the practices of open science. Rapid and pervasive technological changes have led to new ways of production of scientific knowledge, as well as novel practices with respect to communication and interaction in science. The increasing interdependency between science, the economy and society raises new questions about intellectual property rights and about the relationships between the public and private benefits of scientific research. A growing number of interest groups are demanding closer involvement in agenda setting, assessment of scientific practices and results, and greater participation in evaluating the impact of science on people, society and the environment. Politics has a strong interest in utilising the science system’s capacity to contribute to economic growth.

The ambiguity of change processes increases the need for continuous reflection on how science can continue to grow in significance as a public good. There is a widely accepted understanding that open access is a fundamental principle. A principle which is crucial to securing the position of individual researchers and universities as key organisations in knowledge production, and to the concept of unrestricted knowledge exchange.

Since the 1990s, a significant number of academic initiatives have promoted open access and developed strategies for its implementation. One of these, the Berlin Declaration, developed a comprehensive and widely acknowledged definition which characterised open access “as a comprehensive source of human knowledge and cultural heritage that has been approved by the scientific community” (Berlin Declaration, 2003).

Pursuant to the Berlin Declaration of 2003, open access contributions must:

“...satisfy two conditions:

1. The author(s) and right holder(s) of such contributions grant(s) to all users a free, irrevocable, worldwide, right of access to, and a license to copy, use, distribute, transmit and display the work publicly and to make and distribute derivative works, in any digital medium for any responsible purpose, subject to proper attribution of authorship (community standards, will continue to provide the mechanism for enforcement of proper attribution and responsible use of the published work, as they do now), as well as the right to make small numbers of printed copies for their personal use.
2. A complete version of the work and all supplemental materials, including a copy of the permission as stated above, in an appropriate standard electronic format is deposited (and thus published) in at least one online repository using suitable technical standards (such as the Open Archive definitions) that is supported and maintained by an academic institution, scholarly society, government agency, or other well-established organization that seeks to enable Open Access, unrestricted distribution, inter-operability, and long-term archiving.

In the subsequent years, a broad range of strategies to foster implementation of open access were developed at the institutional level in higher education institutions (HEIs). At the same time, scholarly and public debate of the topic which also considered legitimate reasons for restricting access (Prosser 2007) led to a greater understanding of the scope of open access.

In recent years, the prevailing view has emerged that open access is an essential principle which should be strengthened in order to maintain and accelerate scientific progress. The restriction of access to knowledge that is a result of the growing commercialisation of academic publishing is a major concern. This has brought about a paradoxical situation in the knowledge society whereby the number of scientific publications is growing while access

to scientific knowledge is being restricted and becoming more expensive (Willinsky, 2006 p. 16 f.). Indeed, this trend can be viewed as “privatization of information and ideas” which also accentuates the “marginalization of critical discourse” (Longino, 2002 p. 129). In contrast, open access is understood as a strategy with various benefits in terms of scientific progress (Figure 1).

Figure 1. Benefits of open access. *Source: AOASG*



As Figure 1 shows, it can be argued that open access benefits key agents in the HEI sector as well as its stakeholders such as funding agencies, taxpayers and the general public. However, it should be added that, from a historical perspective, open access is also a continuation of an ongoing struggle for transparency, participation and quality assurance in science. When examining the changes within the science system and its relationships with society, politics and economics, it becomes clear that open access is also an important means for rebalancing relationships within science and for rebalancing science’s relationships and interactions with other societal systems.

Modern science as open science: communalism, universalism, disinterestedness and organised scepticism

The idea of science as an open, testable activity which is subject to rigorous reviewing by peers is a key aspect of the concept of modern science. Merton (1973, p. 267 ff.) identified four principles governing science as an individual

activity and as a system: universalism, communalism, disinterestedness and organised scepticism. Communalism refers to the mechanism of acknowledgement by publicity whereby scientists give up intellectual property rights in exchange for recognition and esteem. Universalism ties scientists' claims ('truth-claims') to impersonal criteria. Disinterestedness is reinforced by institutional and social mechanisms of control. And finally, as a methodological and institutional rule, organised scepticism describes the scientific community's structured scrutiny of ideas and results. Scientists benefit from accepting these principles in various ways, the most important being the attribution of originality, professional advancement and reward.

Known as the Mertonian norms of open science (OS), Merton believed that these principles govern scientific and academic behaviour as well as the self-perceptions and the behaviour of scientists as members of the science system. We suggest to include individualism, in terms of proving scientific originality, as an additional principle which governs scientific behaviour.

Conventionally, science can also be understood as a highly expertise-based activity which enables extreme specialisation of students and scholars in order to meet the criteria of the scientific reward system (Fleck, 1935; Kuhn, 1962). Social psychological patterns in these professional fields reward adherence to internal criteria of the science system and support normative delimitation against the expectancies of other systems.

Postmodern science: the state, the economic system and changing modes of knowledge production

Some of the explicit and implicit characteristics of scientific norms stand in sharp contrast to normative elements of other systems, such as the economic system, which tends to favour functional subordination, privatisation of knowledge and which is less interested in organised scepticism governed by abstract rules as long as products and processes work in practice.

Research on how research practices have changed in the last few decades has analysed dynamics which are highly relevant when considering the challenges of achieving open access. A major development which has been observed in recent decades is the closer interaction of academic systems with other agents within or at the edges of the innovation system. One key process in the formation of modern innovation systems is expressed in the triple helix model that points to transformations of the functions of universities, industry and government, which are characterized by increasingly assuming each other's roles (Leydesdorff & Etzkowitz, 2002). The emerging structure of the triple helix "differs fundamentally in its functions and roles from the linear innovation model that existed prior to the emergence of knowledge-based economy" (Leydesdorff & Etzkowitz, 2001 p. 2). The emergence of new forms of interaction between science and industry changes the structures of collaboration:

“Previously, the various agencies worked in hierarchical systems with predefined roles or on markets which forced roles upon them. Now they are expected to assume multiple roles and functions, not only within their own institutions, but within these new networked and hybrid organizations. Such a double-layered system of variation and selection in terms of both institutions and functions can drive itself through very specific (...) into a more complex dynamics insofar as the agencies involved are able to use the knowledge base to change their roles, interactions, and positions. (...) The network arrangements can be considered as an overlay that acts on a variety of institutions and organizations which may crosscut institutional and national boundaries.” (ibid.)

Another perspective emphasises the dynamics of knowledge production and distribution as a result of changing institutional and economic conditions at the micro- and meso-level. The Mode 2 concept of knowledge production developed in the 1990s embraces five characteristics of the new modes of knowledge production (Gibbons et al., 1994 p. 7 ff.):

- knowledge is increasingly produced in contexts of application
- processes of knowledge production are characterised by growing heterogeneity and organisational diversity
- in contexts of knowledge production characterised by involvement of agents from different sectors and/or professional fields transdisciplinarity becomes a key characteristic of the process, and the nature of knowledge involvement of heterogeneous agents with different interests extends the traditional norms of quality in science
- increasing requirement for reflexivity in terms of taking into account a wider range of interests and criteria in knowledge production and dissemination

Both the triple helix model and the Mode 2 concept point towards fundamental changes in the involvement of different systems and sectors and the interaction between heterogeneous agents in knowledge production. Commercialisation is therefore just one process which triggers restrictions in access to data and knowledge. Another highly relevant dynamic is resulting from new, cross-sector of knowledge production which are characterised by new questions about data ownership, intellectual property rights, the basis of collaboration, as well as the dissemination and exploitation of data and knowledge:

“Although many sensitive issues remain to be solved, from questions [of] who owns what and who can give away what under which conditions, to the technicalities of data disclosure, new forms of sharing are rapidly becoming part of the public commons. Eventually, a new culture of sharing, involving citizens as well as researchers, will need to emerge [...]. It will transform authorship and forms of collaboration, the wide-spread sharing of data prior to publication and access to research infrastructures. The boundaries between

public and private will be further eroded and questions of ownership will have to be renegotiated.” (Nowotny, 2015 p. 1603)

In light of these changes, open access appears to be becoming an ever more fundamental condition for the science system’s capacity for renewal and progress based on a set of rules which is accepted in the science system as well as in other systems. Where new modes of knowledge production demonstrate the necessity for connecting highly specialised knowledge, diverse paradigms, methods and routines in a pragmatic concept of science, the exchange of data and knowledge is the basis of interaction. When interactive knowledge production becomes more complex and risky, open access becomes a regulatory framework which enhances the capacity for self-assessment of the validity, reliability, objectivity and practicability of knowledge.

Science policy, innovation policy and open access

The developments described above lend science policy a particular relevance for the promotion of open access (OA). In Europe, there are a wide range of national initiatives which demonstrate the importance of government-funded research and higher education institutions for the implementation of open access. For instance, CERN in Switzerland and the Max Planck Society in Germany were among the first large state-funded research institutions to pursue a rigorous supra-national and cooperative OA policy as early as 2000 (OpenAire, 2018).

A significant number of countries in the European Research Area (ERA) have adopted national OA strategies or programmes, which have therefore given the implementation of OA a programmatic framework at the state and institutional levels. Among the countries to adopt OA strategies were Sweden (in 2006), Ireland (2012), the UK (2013), Denmark (2014), Slovenia (2015), the Czech Republic (2017) and Switzerland (2018) (Science-Metrix 2013 & authors’ own research). In other countries, open access became a part of broader open innovation strategies, such as in Austria in 2016.

Another important measure for promoting OA is making it a key principle in funding schemes. The European Union (EU) took a leading role in the integration of OA into R&D framework programmes (see part 3 of this section), triggering many initiatives at national and regional levels. Regarding the implementation of OA, national governments do not implement direct legislation on OA, but often address this issue through programme schemes and guidelines for research funding developed by research funding agencies (Science-Metrix, 2013).

At the level of higher education institutions, a large number of universities have already implemented institutional strategies or begun such initiatives (see section 4). OA-related programmes at the institutional level encompass the transformation of universities’ publishing strategies as well as setting up repositories and archives to ensure open access to data and content. University presses have been transformed into open access publishing houses in several

countries such as in Sweden in 2012 (AEUP, no date). Many higher education institutions across the world have also started collaborating to establish OA networks in order to share knowledge on strategic, organisational, legal and other issues, and E-learning web portals are already contributing to the exchange of knowledge on OA (fosteropenscience.org).

The issue of copyright goes hand in hand with OA as it is one of the most important intellectual property rights for scientists. It is a topic which has attracted particular interest, and adaptations of the legal framework have been made in many countries in response to the changing publishing conditions. As copyright holders, researchers are required to consider the legal implications of their publishing activities, e.g. whether to work in pure or hybrid OA journals, how to license their work, and third party rights for (digital or non-digital) reproduction of material. A significant number of universities have established corresponding guidelines for researchers, which take into account individual interests and institutional OA publishing strategies.

EU programmes and measures

The first section of this paper highlighted the importance of the principle of open access for the science system. Building on this, we will now provide a more detailed review of the implementation of open access in EU funding programmes. The focus of this section is a discussion of the role and importance of open access in two large-scale EU funding programmes, the framework programmes for research and the Erasmus+ (higher) education and training programme.

Open Access in EU framework programmes

Framework programmes (FPs) have become a primary policy instrument for promoting and funding research activities in the EU, having been introduced in the 1980s.⁶ The consecutive framework programmes of the past two decades, FP6, FP7 and Horizon 2020, have become increasingly embedded in the European Research Area (ERA), a political initiative which was established to advance and integrate research in Europe. The concept for the ERA was launched with publication of the European Commission's Communication Towards a European Research Area in 2000 (European Commission, 2000).⁷

The main objectives of the ERA are to promote “[m]ore effective national research systems”, “transnational co-operation and competition”, an “open labour market for researchers” and “gender equality” in research. The ERA also aims to contribute to the “[o]ptimal circulation, access to and transfer of scientific knowledge” (European Commission 2012a, p. 3 f.) – an aspect that is particularly relevant from the perspective of the evolving science models

⁶ For a detailed overview of the development from the first framework programme (FP1) to Horizon 2020 (FP8) see Reillon 2017.

⁷ For more details on the evolving ERA see Reillon 2016.

and the function of open access, which was outlined in the previous section. In this broader policy context, the framework programmes for research are considered as an important instrument for the implementation of the ERA (Reillon, 2017). The following section will briefly introduce the two most recent framework programmes, FP7 and Horizon 2020, with a particular focus on the growing importance of open access.

Role in the 7th Framework Programme (FP7)

The 7th EU Framework Programme for Research and Technological Development (2007–2013) received an earmarked budget of over EUR 50 billion. FP7 was clustered along four principle objectives (European Commission 2005) and activity areas, which Reillon (2017: 20) summarises as follows:

- “cooperation: support for transnational research projects in 10 thematic areas, with security as a new area and space as an area on its own;
- ideas: supporting bottom-up research projects with individual grants via the establishment of the European Research Council (ERC);
- people: strengthening human capital in research and support mobility; and
- capacities: supporting key aspects of European research and innovation capacities (infrastructures, regional clusters, SMEs, international cooperation).”

Open access was taken up as an important topic in FP7. The European Commission aimed “to provide researchers and other interested members of the public with improved online access to EU-funded research results”, which was “considered a way to improve the EU’s return on research and development investment” (European Commission, 2012b p. 5). As a press release from the European Commission in 2007 shows, economic considerations were one of the factors behind the focus on open access: the accessibility of research results and data was seen as “an important driver for innovation in our increasingly knowledge-based economy” (European Commission, 2007).⁸

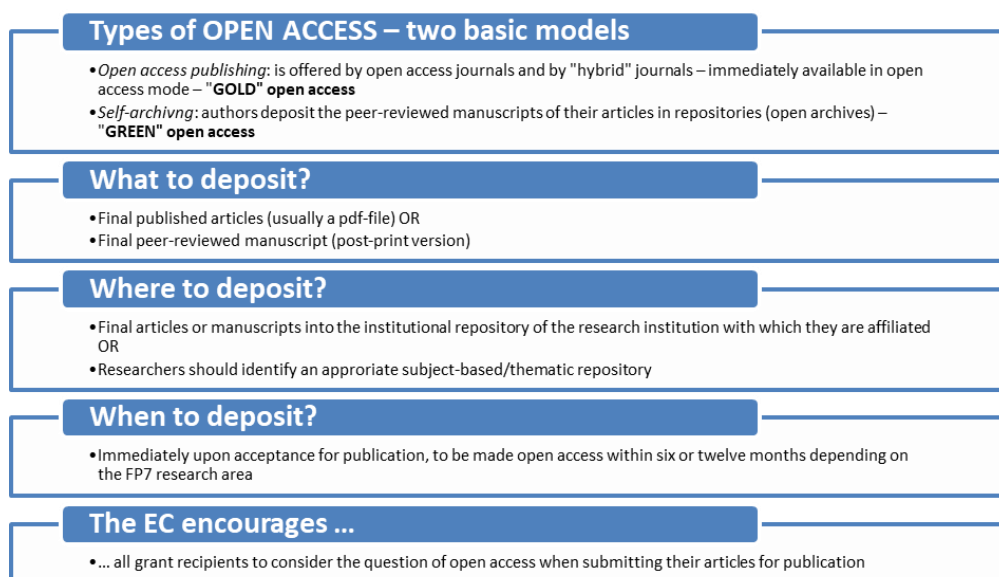
In 2008 the European Commission started implementing its Open Access Pilot in FP7, which continued until the end of the programme. The thematic areas in the framework programme which were selected for this were energy, environment, health, information and communication technologies, research infrastructures, science in society and socio-economic sciences and humanities. Together these areas encompassed about 20 percent of the FP7 budget, and corresponding projects had to comply with pre-defined open

⁸ At the same time it was emphasised that further tools as well as organisational support are required for archiving results and preventing the loss of information (European Commission 2007).

access requirements. The grant agreements⁹ with the European Commission specified that peer-reviewed articles which stemmed from the projects had to be deposited in a repository (European Commission, no date; European Commission, 2012b). Grant holders were also urged to “make their best efforts to ensure the open access” of these publications within a predefined timeframe (European Commission, no date).¹⁰

The following graphic illustrates how to achieve open access and deposit publications linked to the Open Access Pilot in FP7.

Figure 2. Open Access Pilot in FP7. *Source: Authors’ compilation based on European Commission (no date)*



In summary, open access received increased attention in FP7 as a result of the Open Access Pilot. At the same time, a detailed survey of the implementation of open access highlighted continuing challenges for researchers (e.g. legal and technical) and demonstrated the need for further support (European Commission, 2012b).

Role in Horizon 2020

The 8th EU Framework Programme for Research and Innovation (2014–2020), Horizon 2020 (H2020), is the successor programme to FP7 and received an

⁹ For more details see Special Clause 39 on open access in Annex I: http://ec.europa.eu/research/press/2008/pdf/annex_1_new_clauses.pdf (Access: 2018-12-19).

¹⁰ Depending on the subject area, either 6 or 12 months were defined. To support projects in their efforts, funding was made available to contribute to the cost of open access publishing under certain circumstances.

earmarked budget of more than EUR 70 billion.¹¹ At the policy level, Horizon 2020 is closely linked to the implementation of the aims of the ERA (see above) and the Europe 2020 strategy (European Commission, 2010). In a nutshell, the programme aims to contribute to a “society and an economy based on knowledge and innovation” (Aliferi, 2017 p. 3). The ambitious funding programme is clustered along three main pillars (Aliferi, 2017; Reillon, 2015):

- “Excellent science” – focusing on fundamental and exploratory research, competitiveness of the European research and innovation system, and infrastructures, as well as career development and exchange.
- “Industrial leadership” – focusing on technological development and innovation, access to risk financing and support to innovative small and medium sized enterprises.
- “Societal challenges” – focusing on research in a number of pre-defined societal challenges (linked to the EU 2020 strategy); areas which strongly affect society.
- A more detailed overview of the programme structure is provided in the table below.

Table 1. Structure of the Horizon 2020 Programme. *Source: Compilation based on Aliferi (2017) and Reillon (2015)*

Pillar 1: Excellent science	Pillar 2: Industrial leadership	Pillar 3: Societal challenges
• European Research Council (ERC) • Future and emerging technologies (FET) • Marie Skłodowska-Curie actions • Research infrastructures	• Leadership in enabling industrial technologies • Access to risk finance • Innovation in SMEs	• Health, demography, etc. • Food security, agriculture, forestry, etc. • Energy • Transport • Climate, resources • Europe in a changing world • Secure societies
Other objectives:		
• Spreading excellence and widening participation • Science with and for society		
Additional activities:		
• Joint Research Centre (JRC) • European Institute of Innovation and Technology (EIT)		

¹¹ For a more detailed overview of this complex programme see Aliferi (2017) and Reillon (2015).

The importance and visibility of open access has evidently increased.¹² Horizon 2020 has learned from the FP7 Open Access Pilot initiative and enhanced the role of open access in the 2014-2020 funding period (European Commission, 2016a). In the Horizon 2020 framework, open access was defined as “the practice of providing online access to scientific information that is free of charge to the end-user and reusable”. It is emphasized that the programme is open to all scientific disciplines, and a distinction is made between two principle types of information: “peer-reviewed scientific research articles (published in scholarly journals)” and “research data (data underlying publications, curated data and/or raw data)”. There is explicit reference to the Berlin Declaration, which we referred to at the beginning of this paper, in this context. By promoting open access in Horizon 2020, the European Commission expects to enhance aspects such as quality, efficiency, innovation and transparency in scientific processes (European Commission, 2017 p. 3 f.).¹³

With regard to the approach taken to practical implementation of open access in Horizon 2020,¹⁴ specific legal requirements concerning open access have been included in the grant agreements for individual projects. The grant agreement for Horizon 2020 projects specifically stipulates that “Each beneficiary must ensure open access (free of charge, online access for any user) to all peer-reviewed scientific publications relating to its results” (European Commission, 2018a p. 242). In line with broader international trends, in Horizon 2020 open access can be provided in the following two ways (European Commission, 2017; European Commission, 2016a):

- Self-archiving (‘green open access’): the final manuscript of the publication is uploaded to a repository and open access has to be provided within a pre-defined embargo period¹⁵
- Open access publishing (‘gold open access’): the publication is issued in an open access journal or a ‘hybrid journal’, a term referring to a journal which only provides open access to selected articles.¹⁶

In parallel with this, there has also been an increased focus on open access to research data in Horizon 2020. The European Commission is implementing a pilot initiative called the Open Research Data Pilot (ORD Pilot). The pilot was launched on a limited scale in pre-defined areas of Horizon 2020 (European Commission, 2013), and then expanded to enable broad coverage in the

¹² This is in line with the European Commission’s broader priority of increasing access to scientific information, as outlined in a landmark communication of 2012 (European Commission 2012c).

¹³ For further context see also European Commission (2013) and Spichtinger (2013).

¹⁴ Detailed guidelines for grant holders are provided in European Commission (2017) and European Commission (2018a).

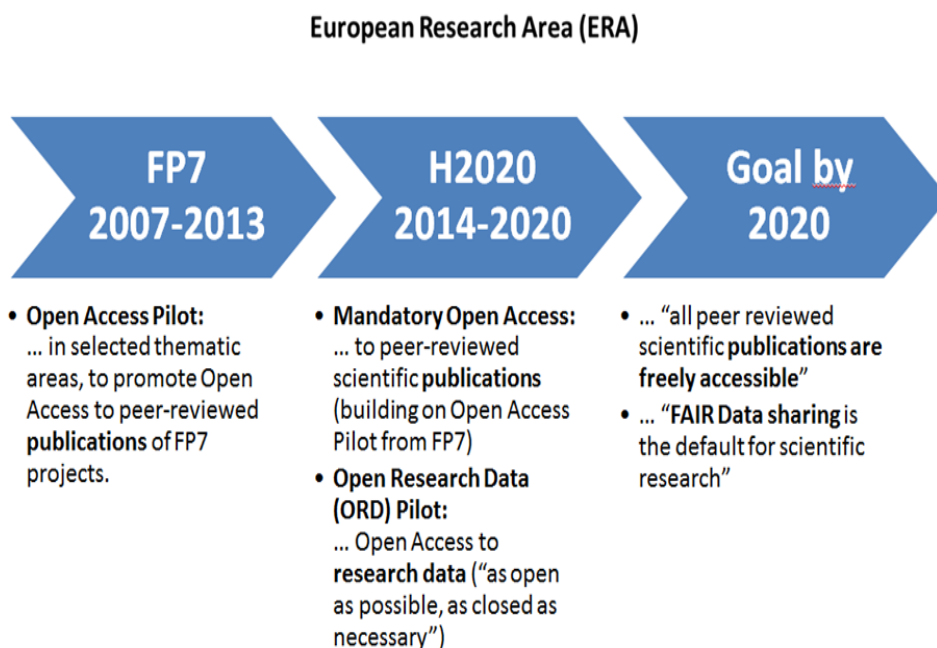
¹⁵ Typically within six months (for the social sciences and humanities up to 12 months).

¹⁶ Here it should be noted that costs of achieving open access publishing are eligible for project funding.

funding programme with the 2017 work programme.¹⁷ The European Commission's approach to research data in Horizon 2020 can be summarised as “as open as possible, as closed as necessary” (European Commission, 2017 p. 8).

This approach means that while open access to research data has become a “default setting” for Horizon 2020 projects in all thematic areas, grant holders have the opportunity to opt out if required. For example, specific opt out agreements – either partial or total – can be concluded to take account of security, personal data protection or envisaged commercial/industrial use issues. Specific regulations to this effect are contained in the grant agreement (European Commission, 2017; European Commission, 2018a). At the operational level, projects in the Open Research Data Pilot are required to formulate a detailed Data Management Plan which addresses the collection and use of data (European Commission, 2016b). The data on which the project publications are based (including metadata) has to be provided in a research data repository. Stakeholders must also be able “to access, mine, exploit, reproduce and disseminate” the data free of charge (European Commission, 2017 p. 10, European Commission, 2018a p. 243). The required data features are summed up by the acronym FAIR, standing for findable, accessible, interoperable and reusable (European Commission 2016a).

Figure 3. European Research Area (ERA). *Source: Authors' compilation based on European Commission 2012b, 2016a, 2017*



¹⁷ Only a few instruments have been excluded, for details see European Commission (2017).

With regard to the current status of implementation, preliminary statistics available on the OpenAire Monitor platform suggest that open access is available to 81.5% of the publications which have been recorded for Horizon 2020 projects (OpenAire, 2018).¹⁸ However, the European Commission undoubtedly has more ambitious goals. Linked to the broader concept of open science¹⁹, it has been stated that by 2020 “all peer reviewed scientific publications” should be freely available, and that the practice of “FAIR Data sharing is the default for scientific research” – implying that, as described above, data should be “findable, accessible, interoperable and reusable” (European Commission, 2016a). In reference to these objectives, the European University Association recommends in a study that, to move towards these goals in the coming years, “awareness of open access and open research data” must be raised among researchers (Morais & Borrell-Damian, 2018). As will be shown in more detail in section 4, a significant level of expertise (e.g. technical and legal expertise) is also required at an institutional level in order to advance open access.

In conclusion, it is evident that the role of open access has increased in the EU framework programmes over the past decade. Building on a pilot initiative in FP7, open access has assumed great importance in Horizon 2020. Open access to peer-reviewed publications has become mandatory in all thematic areas and open research data is being promoted by means of the Open Research Data Pilot. While it remains to be seen whether the ambitious goals outlined above will be achieved, it is clear that important steps to foster open access to research results and data have been taken.

Open access in Erasmus+

After reviewing the role of open access in FP7 and Horizon 2020, this section will briefly look at the role of open access in the Erasmus+ programme. Erasmus+ is a large-scale EU funding programme covering a broad thematic area to support education, training, young people and sport. The programme started in 2014 and will run until 2020. It received an earmarked budget of EUR 14.7 billion.²⁰ While the term Erasmus is most commonly associated with student mobility, the Erasmus+ programme has a much broader scope (Chircop, 2015). In fact, the launch of Erasmus+ has significantly changed the European funding landscape in the field of (higher) education and training, as several predecessor funding schemes were integrated and replaced by Erasmus+. This includes the Lifelong Learning Programme, a set of high-profile programmes in the field of international higher education (Tempus,

¹⁸ As compared to slightly above 70% in FP7.

¹⁹ For information about open science from an EU perspective, see European Commission (2016c).

²⁰ The largest share (77.5%) of this budget is allocated to education and training. Youth (10%) and sport (1.8%) have received relatively small contributions (Chircop 2015).

Erasmus Mundus, Alfa and Edulink), as well as the Youth in Action Programme (Mazur & Chircop, 2016).

At the policy level, the design of Erasmus+ is firmly shaped by Europe 2020 strategy objectives (European Commission, 2010) and the strategic framework for European cooperation in education and training, ET2020 (Council of the European Union, 2009). The activities and projects that can be funded under Erasmus+ are categorised according to three ‘Key Actions’, “Learning Mobility of Individuals”, “Cooperation for Innovation and Exchange of Good Practices”, and “Support for Policy Reforms” (Mazur & Chircop, 2016; Vroonhof et al., 2018). From a higher education and open access perspective, Key Action 2, Cooperation for Innovation and Exchange of Good Practices, is particularly relevant as it funds international higher education projects in areas like “Capacity Building in Higher Education”, “Knowledge Alliances” and “Strategic Partnerships”. Likewise, the “Jean Monnet activities”, which are not categorised under one of the Key Actions, are of relevance given their contribution to research and teaching in the field of European integration studies.²¹

Table 2. Structure of the Erasmus+ programme. *Source: Authors’ compilation based on European Commission 2018b*

Key Action 1: Mobility of Individuals	Key Action 2: Cooperation for Innovation and Exchange of Good Practices	Key Action 3: Support for Policy Reform
• Mobility of learners and staff • Erasmus Mundus Joint Master Degrees • Erasmus+ Master loans	• Strategic Partnerships • Knowledge Alliances • Sector Skills Alliances • Capacity Building projects • IT support platforms •	• Knowledge in education, training and youth • Policy innovation / European policy tools • Stakeholder dialogue, policy and Programme promotion
Additional activities:		
• Jean Monnet activities • Sport		

²¹ For more detailed information on these activities see European Commission (2018a).

In comparison to predecessor programmes, topics related to open access and open educational resources (OER) gained in importance in the Erasmus+ programme. The Erasmus+ Programme Guide, one of the funding scheme's key reference documents, states that "Erasmus+ has an Open Access Requirement for educational resources and encourages Open Access of research results and data" (European Commission, 2018b p. 318). For the purposes of the Erasmus+ programme, the European Commission adopted the following set of definitions. Firstly, open access is defined as "a general concept of publishing materials of a specific kind openly, i.e. to be accessible and usable by the largest possible user group and for the largest number of use cases" (European Commission, 2018b p. 318). Secondly, open educational resources are defined as: "educational materials of any kind (e.g. textbooks, worksheets, lesson plans, instructional videos, entire online courses, educational games) which can be freely used, adapted and shared. OER have either been released under an open license or are in the public domain (i.e. copyright protection has expired). Cost-free materials that cannot be adapted and shared by the public are not OER." (European Commission, 2018b p. 318)

With this policy objective the European Commission aims to "ensure that publicly funded materials provide value to the general public, to increase the value, visibility and reuse of the insights and work of a project, and to ensure long-term access to the results, even if e.g. a beneficiary consortium ceases to exist" (European Commission, 2018b p. 261). This is no surprise given the fact that ensuring the long-term futures of many EU-funded higher education projects has been challenging after the official end of funding periods. At an operational level, support is available for the implementation of the open access requirement in the Erasmus+ programme through the Erasmus+ Project Results Platform (European Commission, 2018c). The platform was launched by the European Commission to provide an infrastructure for the publication of project outcomes. Over the long-term, the Erasmus+ Project Results Platform aims to provide access to summaries and results of all Erasmus+ projects (European Commission, 2018b; European Commission, 2018c). With a view to this, beneficiary institutions are required to upload their project results to the platform at the end of the project life-time.²² At the time of writing the platform already contained information on a total of 94,691 Erasmus+ projects, of which 3,904 (4.1%) have already provided project results.²³

It is evident that open access was taken up as a topic in Erasmus+ and the first steps in developing an open access policy and infrastructure have been taken. However, the actual impact that this will have remains to be seen. Two questions are particularly important in this regard. Firstly, the extent to which the Erasmus+ Project Results Platform will actually be able to provide full

²² Therefore results only become publicly available on the platform after the official closure of a project.

²³ Own calculation based on data available at the Erasmus+ Project Results Platform (European Commission 2018c) as at 19/09/2018.

access to the project results of the large-scale funding programme. Secondly, if the platform will, in practice, be used as an information hub to access EU project results by stakeholders. These issues require further monitoring and attention, in order to successfully strengthen the role of open access in Erasmus+ and “increase the value, visibility and reuse of the insights and work” (European Commission, 2018b p. 261) as desired by the European Commission. Interim reviews of the Erasmus+ programme have provided important findings on the implementation of this ambitious funding scheme (Zygierewicz, 2016; Gaebel & Stoeber, 2016; Vroonhof et al., 2018). However, these studies did not evaluate experiences in connection with open access in Erasmus+, indicating a need for further research.

Implementation at the university level

As shown in the previous sections, open access has started to play an important role in governmental science strategies as well as in funding policies. Higher education and research institutions are increasingly being required to comply with open access rules when seeking to win public research funding. This section aims to provide a broader perspective on the strategic and practical aspects that higher education institutions need to consider when implementing open access.

Institutional approaches and implementation

There are various routes to open access. Swan (2012 p. 41) identifies three strategic approaches: policy-oriented, advocacy-based, and focus on infrastructure development. At a more operational level Blanchett & De Groff (2017) outline five areas which should be taken into account in open access planning: baselining and policy compliance; structures and workflows; advocacy; cost management; and metadata and systems interoperability. Their recommendations are based on the UK’s Open Access Good Practice (OAGP) initiative, which ran from 2014 to 2016 and involved 30 UK pathfinder institutions in the higher education sector (DeGroff, 2017).

In the course of the OAGP initiative, the Collaborative Institutional Assessment of Open Access (CIAO) tool was developed to evaluate an institution’s readiness for open access according to eleven capabilities at five stages of implementation. For each combination of capability and stage, the tool provides guiding questions for assessment of the progress a higher education institution has achieved and for defining the next steps to be taken (see Oxford Brookes University, 2015).

The OAGP initiative collected records from implementation processes implemented by thirteen UK universities (available online, see HHuLOA, 2016). The records are subdivided into ten different areas of institutional action: systems integration, workflows, open access standards, metadata,

university policy, staffing, advocacy, success stories, issues, and current or future steps of implementation.

Each university provided records every six months, reporting on aspects of the progress achieved as well as the challenges faced and the insights gained. In November 2015, a review of the initial activities highlighted some of these insights (Awre, 2015). One of the findings was that libraries were being given the responsibility for organising repositories. Libraries were also playing a key role in implementation and in quality assurance of the open access process. With respect to routine open access related activities, although automated tools were being used for metadata entry, much of the work was still being done manually. Institutional policies were strongly focused on green open access. Initial experiences also revealed that support services were facing challenges on account of the significant amount of resources required for the implementation of open access.

Table 3. *Stages and dimensions of open access implementation. Source: Oxford Brookes University 2015 pp. 2-4*

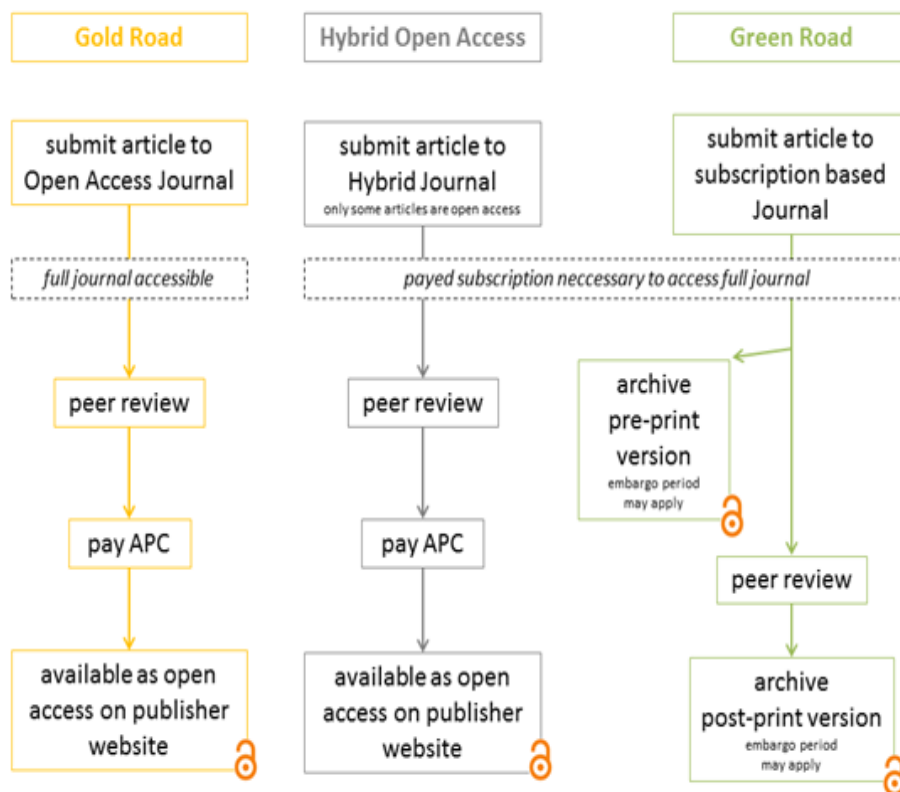
Stages Dimensions	Envisioni ng & Initiating	Discoveri ng	Designing & Piloting	Rolling out	Embeddi ng
Institutional Policy & Strategy on OA					
Financing OA					
Services for OA support					
System to gather data for OA compliance					
Documentation/vis ibility of process					
Reporting, monitoring and audit					
Publication embargoes					
Advocacy					
Advice on where to publish in an OA environment					
Impact of OA on research profile					
Outputs, e.g. books, non-textual and research data not yet OA					

Financial considerations

Cost management is one of the first issues to come up in any discussion about the various open access models, or ‘roads’, since each model entails different costs and efforts depending on the particular institutional and legal approaches towards publishing.

The main distinction is between ‘gold’, ‘green’ and ‘hybrid’ open access. ‘Gold’ open access refers to primary publication of academic works in open access journals or books. In the ‘green’ open access model, authors publish their works in addition to journals or books via self-archiving in institutional or subject repositories. While publishing under the gold open access model usually requires payment of an Article Processing Charge (APC) per publication, such charges do not occur for self-archiving under the green model. However, self-archiving entails administrative effort and costs for the implementation and maintenance of repositories. In the ‘hybrid’ open access model, “articles are made openly available, against the payment of an Article Processing Charge (APC), while other articles remain closed access, and the journal as a whole subscription-based” (Matthias, 2018).

Figure 4. *Types of Open Access. Source: Cornelia Panzenböck*



According to recent information published by the University of Cambridge, the amount that publishers charge varies considerably: The average range for APCs for both, publications under the gold and under the hybrid model, is between Euro 2300-3500 (University of Cambridge, no date).

The hybrid model is controversial because academic institutions must pay for publication as well as for the full subscription to get access to the closed-access parts of the journal. The publishers therefore receive double or multiple payments, financed by public funds, for the same article, a practice coined ‘double-dipping’ (Matthias, 2018). For this reason, many public funding bodies no longer reimburse publication costs if the work is not published with full open access. Plan S of the newly founded cOAlition S²⁴, which comprises 13 national funding bodies supported by the European Commission, explicitly states that the hybrid publishing model is not compatible with its principles.

Higher education institutions deal with the financial aspects of open access in several ways. Institutions who wish to encourage open access publishing often set up publishing funds to finance its authors’ APCs.

TEXTBOX: Publication fund of the Technical University of Applied Sciences Wildau (TH Wildau, Germany)

Open access at the Technical University of Applied Sciences Wildau in Germany was initiated at a conference on open access which the university hosted in cooperation with the local library network (KOBV Kooperativer Bibliotheksverbund Berlin-Brandenburg) in 2006. In the same year, the university launched its institutional publication server, and in 2007 it signed the Berlin declaration. A year later, the State of Brandenburg’s Higher Education Act was revised to mandate “Open Access to scholarly information in university libraries” (Arbeitsgruppe Open Access n.d. p. 28).

In most cases, TU Wildau opted for the green road to open access, which requires investment of time in researching, communicating and consultation on self-archiving options. Since 2010, funding for open access publications has been allocated to the library budget (Seeliger, 2012), and the university has continued to develop funding for open access and also received financial support from the Deutsche Forschungsgemeinschaft (DFG). The publishing output of all authors affiliated with the university has been analysed to determine the amount of money that is required to cover APCs. This analysis was based on data from Web of Science as well as PubLister, a service which provides individual publication lists for researchers at TH Wildau. TH Wildau reimburses APCs of up to EUR 2,000 if an article is published in gold open access journals which are listed in the Directory of Open Access Journals (DOAJ)²⁵.

²⁴ cOAlition S / Plan S, <https://www.coalition-s.org>, accessed: 11/04/2018.

²⁵ Directory of Open Access Journals (DOAJ), <https://doaj.org/> (Accessed on 20/12/2018)

Hybrid journals are excluded. In the interest of transparency, all APCs paid by the university are reported to OpenAPC²⁶. The remaining funds for the year are openly available on the university website. The university library also provides a designated member of staff to help authors with any questions or concerns (Borchert n.d.).

While establishing publication funds helps authors to publish in costly journals, it does not support changes to the publishing landscape. Schimmer et al. (2015) argued that there is already enough money in the current system to make a large-scale shift from subscription-based to services-based payments for Open Access publishing without additional costs.

A growing number of higher education institutions are using ‘offsetting’ and ‘read and publish’ agreements to change their scholarly publishing business models with the goal of bringing about a general shift to open access publishing (Schimmer et. al., 2012 p. 10). In offsetting deals, the APCs paid by an institution are deducted from subscription costs. Other models offer a discount on APCs for institutions holding a subscription. Read and publish deals include a certain number of APCs which are available to corresponding authors affiliated with an eligible institution (Bauer et. al., 2018 p. 468).

Since individual institutions usually do not have the power to negotiate such transformative deals with publishing houses, this is often undertaken by library consortia (Bauer et al., 2018 p. 468). Project DEAL²⁷, for example, is working towards national licensing agreements for Germany which include a transformative open access component. In Austria, KEMÖ²⁸, a consortium of academic libraries, is negotiating offsetting and read and publish deals with publishers within the scope of the Austrian Transition to Open Access (AT2OA) project (Bauer et. al., 2018 p. 468). Seven such agreements have already been concluded.

Legal considerations

The choice of licensing model for a publication intended for open access is important as it has a major impact on the reusability of the publication. Creative Commons (CC) licenses were developed to enable creators to freely choose how their work can be used or adapted. CC licenses allow producers (authors) to define the rights they grant for further commercial or non-commercial use or processing (Lessig, 2005). Creative Commons, a not for profit organisation, develops standard license contracts for authors and creators to use free of charge. These licenses have been updated over the years, resulting in a number of different versions. The current version is CC 4.0.

²⁶ OpenAPC initiative, <https://treemaps.intact-project.org/> (Accessed on 20/12/2018)

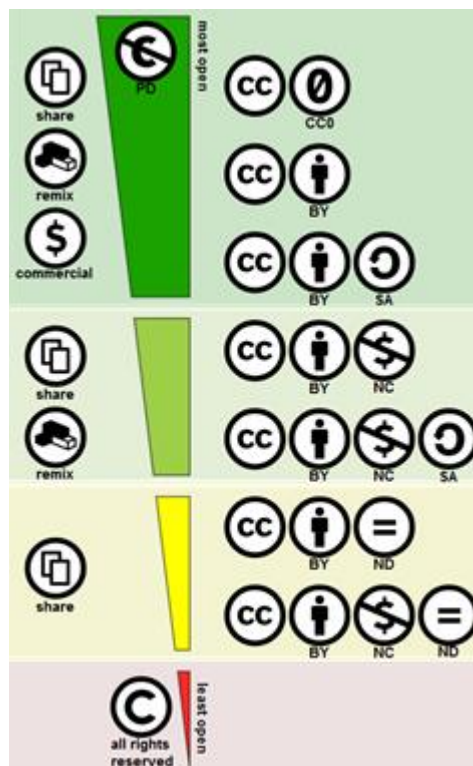
²⁷ Project DEAL, <https://www.projekt-deal.de/about-deal/> (Accessed on 20/12/2018)

²⁸ Austrian Academic Library Consortium (KEMÖ), <https://www.konsortien.at/default-en.asp> (Accessed on 20/12/2018)

The Creative Commons licensing model helps authors to select an appropriate license model before publishing by requiring them to answer two important questions:

- Do you want to permit commercial use of the work?
- Under what circumstances will you permit the sharing of adaptations of the work, if at all?
- The answers to these questions are communicated by the corresponding abbreviations BY (attribution), NC (non-commercial), ND (no-derivatives), and SA (share alike).
- A CC-BY license permits redistribution and reuse of a work as long as the creator is appropriately credited.
- CC-BY-NC only permits non-commercial redistribution and non-commercial reuse of a work as long as the creator is appropriately credited.
- CC-BY-ND permits the redistribution and reuse of a work as long as the creator is appropriately credited, but distribution of any derivative work is not permitted.
- The addition of SA to any other license (e.g. CC-BY-SA or CC-BY-NC-SA) means that any derivative work must be made available under an identical license. This ensures that the same freedoms as the original are granted for all resulting works.

Figure 5. *Original CC license symbols by Creative Commons. Source: Wikimedia Commons 2016*



If an author requires an open access license which conforms to the Berlin Declaration (see section 2 of this paper), their choices are narrowed down significantly. CC-BY (attribution) most closely corresponds to the Declaration's definition of open access. The right to make and distribute derivatives is a specific stipulation of the Berlin Declaration, which rules out ND (no derivatives) licenses.

Infrastructure and resources

A repository is a digital platform where authors can deposit copies of their articles. Repositories are therefore an essential element of any open access infrastructure. Self-archiving is another term used to refer to the green road to open access. R&D funding schemes often require authors to ensure full open access within a specified time frame or immediately after publication. Obligations such as these may conflict with publishers' interests in restricting open access to certain versions of manuscripts or in preventing access to journals for non-paying users during an embargo period.

In order to ensure full and immediate open access to the results of publicly funded research, initiatives such as Plan S do not allow embargo periods at all and require authors to make articles openly available immediately after publication.²⁹ SHERPA/RoMEO³⁰, a database of self-archiving permissions and conditions of rights given to authors on a journal-by-journal basis, is a helpful tool for determining which journal or publisher is compatible with specific author obligations. Institutional and governmental repositories are run by academic institutions and governments. They typically contain works by authors affiliated with the institution in question. Repositories which collect works from authors regardless of their institutional affiliations and focus on a specific subject area are termed disciplinary or subject repositories³¹.

The openDOAR³² directory lists repositories from all over the world, mainly publication repositories rather than research data repositories. Re3data.org³³ is an example of a catalogue containing research data repositories. Content types in research data repositories can range from images and audio-visual materials to raw data, databases and source code. A range of software solutions³⁴ are available to institutions who wish to host their own repository, many of which are free and open source. While the software itself is provided free of charge, commercial hosted solutions and customer support

²⁹ cOAlition S / Plan S, <https://www.coalition-s.org/feedback/>, (Access: 2018-12-20).

³⁰ SHERPA/RoMEO, <http://www.sherpa.ac.uk/romeo/about.php?la=en>, (Access: 2018-12-20).

³¹ See, for instance, arXiv.org; <https://arxiv.org/>, or EconStor; <https://www.econstor.eu/> (accessed on 20/12/2018)

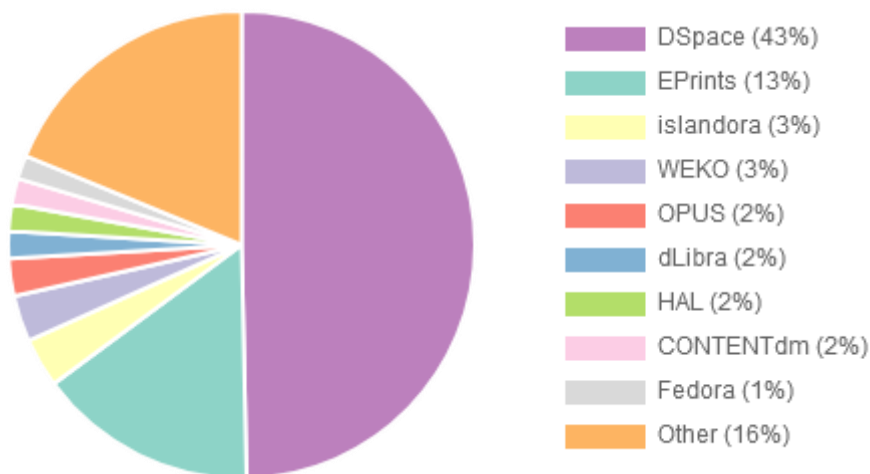
³² openDOAR, <http://v2.sherpa.ac.uk/opensdoar/>, (accessed on 20/12/2018).

³³ Registry of Research Data Repositories, <https://www.re3data.org/> (accessed on 20/12/2018).

³⁴ See, for instance, the product comparison table provided by Repository Software Survey, <http://www.rsp.ac.uk/start/software-survey/results-2010/>, (accessed on 20/12/2018).

may be offered. DSpace³⁵, from DuraSpace³⁶, is the most popular repository software and is used by 43% of repositories listed on openDOAR³⁷. DuraSpace also offers modular repository software called Fedora³⁸, and a fully hosted solution called DuraCloud³⁹.

Figure 6. Overview of software platforms. *Source: OpenDOAR Statistics*



Another free and open source software platform is EPrints⁴⁰, which is used by 13% of the repositories on openDOAR, making it the second most popular. It is developed at the University of Southampton. Commercial hosting and support packages are available.

Whether an institution opts to pay for a fully hosted solution or maintains its own in-house installation depends on financial considerations and on the knowledge and skills of IT staff. The Existing infrastructure also determines the systems interoperability and metadata standards. Blanchett & DeGroff (2017 p.26) give an introductory overview on these topics and provide links to further information.

TEXTBOX: Justus Liebig University Giessen (Germany)

At Justus Liebig University Giessen (JLU) in Germany, the first step taken by its open access committee was to adopt an open access resolution to demonstrate management's commitment to the principle.

³⁵ DSpace, <https://duraspace.org/dspace/>, (accessed on 20/12/2018).

³⁶ DuraSpace, <https://duraspace.org/>, (accessed on 20/12/2018).

³⁷ OpenDOAR Statistics, http://v2.sherpa.ac.uk/view/repository_visualisations/1.html, (accessed on 20/12/2018).

³⁸ Fedora, <https://duraspace.org/fedora/>, (accessed on 20/12/2018).

³⁹ DuraCloud, <https://duraspace.org/duracloud/>, (accessed on 20/12/2018).

⁴⁰ Eprints, <http://www.eprints.org/uk/>, (accessed on 20/12/2018).

The university has been running an institutional repository, the Gießener Elektronische Bibliothek⁴¹ (GEB, Giessen electronic library) since 1998, where authors can self-archive their publications (Ruckelshausen, 2012). In 2013, GEB was awarded the DINI Certificate of the German Network Information Initiative for Open Access repositories and publication services.⁴² In 2011, the university set up an open access publication fund to promote gold open access.

JLU also offers a range of information services for authors encompassing printed materials and roadshows and workshops for PhD students, as well as advice on the use of Creative Commons licenses and print on demand services (Ruckelshausen, 2012).

As mentioned above, providing open access requires human resources for maintaining and managing the institutional repository and providing support to users. There are also other areas where staffing for support services is required. Authors need to be provided with advice on publishing options and the publishers' policies, as well as information relating to their rights as intellectual property holders, as Creative Commons licences can be confusing initially. Depending on the institution in question, these services may be provided by a central open access office or various existing departments.

Conclusions

The importance of open access in EU-funding schemes has increased significantly in recent years. The recent EU framework programmes for research and the Erasmus+ programme have developed open access policies and specific regulations for funded projects in order to make project results, publications and data accessible to the scientific community and other interested stakeholders free of charge.

As shown at the beginning of this paper, open access plays an important role with respect to the science system's capacity for renewal and progress. Therefore, the strengthening of the role of open access in the funding regulations of the EU programmes has the potential to provide an important stimulus for the development of the science system. As the relevant EU policy documents show, in parallel with this, broader economic and societal considerations have also been drivers for the increased focus on open access. However, it should also be noted that further evaluation of the actual implementation and impact of open access regulations in the funding programmes is required in order to monitor whether the ambitious policy objectives are really being achieved.

The increased importance of open access has created both new challenges and opportunities for universities and researchers. In order to participate in EU-

⁴¹ Gießener Elektronische Bibliothek, <http://geb.uni-giessen.de/geb/about.php?la=en>, (accessed on 20/12/2018).

⁴² Deutsche Initiative für Netzwerkinformation e.V., DINI Certificate, <https://dini.de/dienste-projekte/dini-zertifikat/english/about-the-certificate/>, (accessed on 20/12/2018).

funded projects institutions and individuals need to continue to develop their capacities and expertise in implementing open access. In light of the experiences of universities which are at an advanced stage of implementation, some conclusions about the main challenges can be drawn:

- Implementing open access is an extensive task encompassing strategy formation, resource allocation, organisational development, and development of specialist expertise. The capacity to devise an integrated strategy can therefore be regarded as an important key to success.
- With regard to strategy formation, example cases from universities with significant experience of open access demonstrate the importance of taking into account the interplay of financial, staffing and technical resource considerations in determining objectives, as well as in the planning of implementation measures. For universities participating in EU programmes this becomes crucial at all project stages (project application and planning, implementation, transfer and exploitation of results) because universities have to ensure compliance with open access regulations at every stage.
- Making the right choices with respect to the various roads to open access is a key issue for universities. This is a step which needs to be taken before implementation. It involves rigorous assessment of the advantages and disadvantages of the selected option, and the measures and resources needed to implement it.
- Organisational development, including development of technical infrastructure, is a key aspect of implementing open access. Example cases show that effective cooperation between library and IT services, as well as legal, financial, and research departments is an essential requirement in open access processes.
- Open access therefore creates a new area of human resource development concerned with improving technical, legal, financial, consultative and administrative expertise in the departments concerned, as well as the training of and provision of information for researchers with respect to publication and licensing models, intellectual property rights, use of repositories, data management, and legal and technical requirements.

Building alliances and partnerships is a promising approach to learning from others and sharing experiences and knowledge. Since open access is closely connected with commercial interests and market forces, building alliances is a viable instrument for creating synergies by means of pooling resources and funds in order to secure the role of universities as agents of open science.

Funding: This publication was prepared as part of the Erasmus+ Capacity Building in Higher Education Project “Promoting Excellence in Teaching and Learning in Azerbaijani Universities” (PETRA, project number: 573630-EPP-1-2016-1-ES-EPPKA2-CBHE-JP). This project has been funded with support

from the European Commission. This publication reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein. Further information on the project is available at: www.petraproject.net.



Co-funded by the
Erasmus+ Programme
of the European Union

References

- AEUP. (no date). Association of European University. Retrieved from <http://www.aeup.eu/aeup/stockholm-university-press-one-of-the-first-open-access-university-presses-in-sweden>
- Aliferi, A. (2017). *Horizon 2020. Briefing – How the EU budget is spent*. Brussels: European Parliamentary Research Service.
- Australasian Open Access Strategy Group (AOASG). (2020). Why Open Access? Retrieved from <https://aoasg.org.au/resources/benefits-of-open-access>.
- Awre, C. (2015). Baseline Open Access assessment: themes and trends. Retrieved from <https://library.hud.ac.uk/blogs/hhuloa/2015/11/13/baseline-open-access-assessment-themes-and-trends/>
- Awre, C. (2016). HHuLOA Open Access Good Practice pathfinder project final report. Retrived from <http://repository.jisc.ac.uk/6540/>
- Bauer, B., Capellaro, C., Ferus, A., Fessler, G., Granat, R., Hölbling, L., Kaier, C., Koren-Wilhelmer, F. Kromp, B., Seissl, M. & Zarka, T. (2018). Austrian Transition to Open Access (AT2OA). In: *BIBLIOTHEK Forschung und Praxis*, 42, 463-475. <https://doi.org/10.1515/bfp-2018-0062>.
- Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities. (2020). Retrieved from <https://openaccess.mpg.de/Berliner-Erklärung>.
- Blanchett, H. & DeGross, H. (2017). Moving Open Access implementation forward. *A handbook for Open Access good practice based on experiences of UK higher education institutions*. Bristol: Jisc. Retrived from <http://repository.jisc.ac.uk/id/eprint/6565>.
- Borchert, F. (n.d.). Einrichtung eines Open-Access-Publikationsfonds an der TH Wildau für die Jahre 2018-2019. Teil B: Beschreibung des Vorhabens. Retrieved from https://www.thwildau.de/files/Bibliothek/Dokumente/Open_Access/THWildau_Publikationsfonds_18-19.pdf.
- Chircop, D. (2015). *Erasmus+: more than just mobility*. Brussels: European Parliamentary Research Service.
- Council of the European Union. (2009). *Council conclusions of 12 May 2009 on a strategic framework for European cooperation in education and training ('ET 2020')*. Brussels: Council of the European Union.
- Creative Commons Australia. (2009). Which Creative Commons licence is right for me? Retrieved from <https://creativecommons.org.au/learn/fact-sheets/licensing-flowchart/>
- Creative Commons. (no date). Creative Commons Licensing Types. Retrieved from <https://creativecommons.org/share-your-work/licensing-types-examples>.

- DeGroot, H. (2017). *Open Access good practice initiative: Final project report*. Retrieved from <http://repository.jisc.ac.uk/id/eprint/6566>.
- European Commission. (2013). *Fact sheet: Open Access in Horizon 2020*. Brussels: European Commission.
- European Commission. (2000). *Towards a European research area*. Communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions. COM (2000) 6. Brussels: European Commission.
- European Commission. (2005). *Building the ERA of knowledge for growth*. Communication from the European Commission. COM(2005) 118. Brussels: European Commission.
- European Commission. (2007). *Scientific information in the digital age: Ensuring current and future access for research and innovation*. Brussels: European Commission. Retrieved from http://europa.eu/rapid/press-release_IP-07-190_en.htm.
- European Commission. (2010). *Europe 2020. A strategy for smart, sustainable and inclusive growth*. Communication from the European Commission, COM(2010) 2020, Brussels: European Commission.
- European Commission. (2012a). *A Reinforced European Research Area Partnership for Excellence and Growth*. Communication from the Commission to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions. COM(2012) 392. Brussels: European Commission.
- European Commission. (2012b). *Survey on open access in FP7*. Brussels: European Commission.
- European Commission. (2012c). *Towards better access to scientific information: Boosting the benefits of public investments in research*. Communication from the Commission to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions. COM(2012) 401. Brussels: European Commission.
- European Commission. (2016a). *Background Note on Open Access to Scientific Publications and Open Research Data*. Brussels: European Commission, Directorate-General for Research and Innovation (RTD).
- European Commission. (2016b). *H2020 Programme. Guidelines on FAIR Data Management in Horizon 2020*. Version 3.0, 26 July 2016. Brussels: European Commission.
- European Commission. (2016c). *Open Innovation, Open Science, Open to the World. A Vision for Europe*. Brussels: European Commission.
- European Commission. (2017). *H2020 Programme. Guidelines to the Rules on Open Access to Scientific Publications and Open Access to Research Data in Horizon 2020*. Version 3.2, 21 March 2017. Brussels: European Commission.
- European Commission. (2018a). *H2020 Programme. AGA – Annotated Model Grant Agreement*. Version 5.1, 6 December 2018. Brussels: European Commission.
- European Commission. (2018b). *Erasmus+ Programme Guide*. Version 3 (2018) 18/8/2018. Retrieved from https://ec.europa.eu/programmes/erasmus-plus/sites/erasmusplus2/files/erasmus-plus-programme-guide3_en.pdf.

- European Commission. (2018c). *European Project Results Platform*. Retrieved from <http://ec.europa.eu/programmes/erasmus-plus/projects>.
- European Commission. (no date). *Open Access Pilot in FP7*. Brussels: European Commission.
- Fleck, L. (2012). *Genesis and Development of a Scientific Fact*. Chicago: Chicago University Press.
- Fournier, J., Klages, T. & Pampel, H. (2012). Open-Access-Strategien für wissenschaftliche Einrichtungen: Bausteine und Beispiele, (Arbeitsgruppe Open Access der Schwerpunktinitiative Digitale Information der Allianz der deutschen Wissenschaftsorganisationen, Ed.), 39 p. <https://doi.org/10.2312/allianzoa.005>
- Gaebel, M. & Stoeber, H. (2016). *EUA Member Consultation*. A Contribution to the Erasmus+ Mid-Term Review. Brussels: European University Association.
- Geschäftsmodelle*. Retrieved from <https://open-access.net/AT-EN/informationen-zu-open-access/geschaeftsmodelle/#c833>
- Gibbons, M., Limoges, C., Nowotny, H., Schwartzman, S., Scott, P. & Trow, M. (1994). The New Production of Knowledge. *The Dynamics of Science and Research in Contemporary Societies*. London: Sage.
- HHuLOA. (2016). *OA baselining spreadsheet*. Retrieved from https://docs.google.com/spreadsheets/d/1MN7Qw_wlU2LMGnlcmjzgufJZuhzL6F_ay4lhcQEGKv8/edit#gid=0.
- KEMÖ. (2018). *Open-Access-Vereinbarungen in Österreich*. Retrieved from <https://www.konsortien.at/openaccess.asp>.
- Kuhn, T. S. (1962). *The Structure of Scientific Revolutions*. Chicago: Chicago University Press.
- Lessig, L. (2005). *CC in Review: Lawrence Lessig on How it All Began*. Retrieved from <https://creativecommons.org/2005/10/12/ccinreviewlawrencelessigonhowitallbegan/>.
- Leydesdorff, L. & Etzkowitz, H. (2001). "The Transformation of University-Industry-Government Relations". *Electronic Journal of Sociology*, 5(4), 338-344.
- Leydesdorff, L. & Etzkowitz, H. (Eds.) (2002). *Universities and the Global Knowledge Economy: A Triple Helix of University-Industry-Government Relations*. London: Bloomsbury.
- Longino, H. (2002). *The Fate of Knowledge*. Princeton: Princeton University Press.
- Matthias, L. (2018). *The worst of both worlds: Hybrid Open Access*. Retrieved from <https://blogs.openaire.eu/?p=3431>. Accessed on 4/11/2018.
- Mazur, S. & Chircop, D. (2016). *Erasmus+. Briefing – How the EU budget is spent*. Brussels: European Parliamentary Research Service.
- Merton, R., K. (1973). *The Sociology of Science. Theoretical and Empirical Investigations*. Chicago: University of Chicago Press.
- Morais, R. & Borrell-Damian, L. (2018). *Open Access. 2016-2017 EUA Survey Results*. Brussels: European University Association.
- Nowotny, H. (2015). The radical openness of science and innovation. Why uncertainty is inherent in the openness towards the future. *EMBO reports*, 16(12), 1601-1604.
- Nowotny, H., Scott, P. & Gibbons, M. (2003). 'Mode 2' Revisited: The New Production of Knowledge. *Minerva*, 41, 179-194.

- OpenAire. (2018). *European Commission - H2020. Publications by access mode*. Retrieved from <https://monitor.openaire.eu/h2020-stats-new>
- OpenAire. (no date). *Open Science and Open Access platform*. Retrieved <https://www.openaire.eu/item/france>
- Oxford Brookes University. (2015). *CIAO - Collaborative Institutional Assessment of Open Access*. (Pilot version). Oxford. Retrieved from <https://radar.brookes.ac.uk/radar/items/695b9555-c2f4-4aae-9107-176fa04531b4/1/>
- Projekt DEAL. (2018). *About DEAL*. Retrieved from <https://www.projekt-deal.de/about-deal>
- Prosser, D. C. (2007). Public Policy and the Politics of Open Access. *LIBER Quarterly* 17(2), p. none. DOI: <http://doi.org/10.18352/lq.7877>.
- Reillon, V. (2015). *Horizon 2020 budget and implementation. A guide to the structure of the programme*. Brussels: European Parliamentary Research Service.
- Reillon, V. (2016). *The European Research Area. Evolving concept, implementation challenges*. Brussels: European Parliamentary Research Service.
- Reillon, V. (2017). *EU framework programmes for research and innovation. Evolution and key data from FP1 to Horizon 2020 in view of FP9*. Brussels: European Parliamentary Research Service.
- Ruckelshausen, F. (2012). Umsetzung der Open-Access-Strategie der Justus-Liebig-Universität Gießen. *Open-Access-Strategien für wissenschaftliche Einrichtungen: Bausteine und Beispiele*. Potsdam: Arbeitsgruppe Open Access der Schwerpunktinitiative Digitale Information der Allianz der deutschen Wissenschaftsorganisationen, 25-27. <https://doi.org/10.2312/allianzoa.005>.
- Schimmer, R., Geschuhn, K. K. & Vogler, A. (2015). *Disrupting the subscription journals' business model for the necessary large-scale transformation to Open Access*. doi:10.17617/1.3. <http://hdl.handle.net/11858/00-001M-0000-0026-C274-7>.
- Science Metrix. (2013). *Open Access Strategies in the European Research Area*; Retrieved http://www.science-metrix.com/pdf/SM_EC_OA_Policies.pdf.
- Seeliger, F. (2012). Rahmenbedingungen für Open Access am Beispiel der Fachhochschule Wildau (Brandenburg). *Open-Access-Strategien für wissenschaftliche Einrichtungen: Bausteine und Beispiele*. Potsdam: Arbeitsgruppe Open Access der Schwerpunktinitiative Digitale Information der Allianz der deutschen Wissenschaftsorganisationen, 28-30. <https://doi.org/10.2312/allianzoa.005>.
- Spichtinger, D. (2013). Open access in the European Research Area: FP7 and Horizon 2020. *The European IPR Helpdesk*, 11, October - December, 2-4.
- Swan, A. (2012). *Policy guidelines for the development and promotion of Open Access*. Paris: United Nations Educational, Scientific, and Cultural Organization. Retrieved from <http://unesdoc.unesco.org/images/0021/002158/215863e.pdf>.
- The Royal Society. (2012). *Science as an open enterprise: open data for open science*. Retrieved from <https://royalsociety.org/topics-policy/projects/science-public-enterprise/report>.
- University of Cambridge. (no date). *How much do publishers charge for Open Access?* Retrieved from <https://www.openaccess.cam.ac.uk/paying-open-access/how-much-do-publishers-charge-open-access>.

- Vroonhof, P., Van der Graf, A. & Buiskool, B. (2018). *Research for CULT Committee. Erasmus+ - Towards a New Programme Generation*. Brussels: European Parliament, Policy Department for Structural and Cohesion Policies.
- Willinsky, J. (2006). *The Access Principle: The Case for Open Access to Research and Scholarship*. Cambridge: MIT Press.
- Zygierewicz, A. (2016). *The Erasmus+ Programme (Regulation EU No. 1288/2013) – European Implementation Assessment*. Brussels: European Parliamentary Research Service.



© 2020 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).

Digitalization in higher education

Pieta Sikström¹, Saana Mehtälä², Kati Clements³, Tiina Mäkelä⁴, Leena Hiltunen⁵, Marja Kankaanranta⁶

Recommended citation:

Sikström, P., Mehtälä, S., Clements, K., Mäkelä, T., Hiltunen, L. & Kankaanranta, M. (2020). Digitalization in higher education. In G. Erdei, G. Pusztai, E. Juhász & J.O. Messana (Eds.), *Capacity Building and Development in Higher Education* (pp. 79-85). Debrecen, Debrecen University Press.

Abstract

We have lived through rapid societal and economical change during the past two decades. To be able to communicate and be active citizen in digitalized world one must have digital competence. Labor market has been digitalized and students need to be prepared to meet the future needs of working life. Teachers play a keyrole since education is the most efficient way to increase digital competence. Digital skills can be defined nowadays as transversal skills meaning that individual can earn them on one field and transfer them to another field. As the world is changing in accelerating phase the higher education needs to adapt to the change by reviewing existing practices and their validity. Cultural change of education means paradigm change from traditional education to smart education.

Keywords: SMART Education Framework, teaching excellence, technology enhanced learning

Introduction

The fourth industrial revolution (FIR), which can be defined as an age of advanced information and communication technology, has already had more impact on all the areas of lives than previous industrial revolutions (Schwab, 2017). Forecasts predict that 40-60% of existing jobs will disappear in the future due to digitalization, but at the same time new jobs will appear for the same reason. This development will require new skills even though it is

¹ University of Jyväskylä, IT Faculty; pieta.sikstrom@jyu.fi

² University of Jyväskylä, IT Faculty; saana.s.s.mehtala@jyu.fi

³ University of Jyväskylä, IT Faculty; kati.clements@jyu.fi

⁴ University of Jyväskylä, Finnish Institute for Educational Research; tiina.m.makela@jyu.fi

⁵ University of Jyväskylä, IT Faculty; leena.r.k.hiltunen@jyu.fi

⁶ University of Jyväskylä, Finnish Institute for Educational Research; marja.kankaanranta@jyu.fi

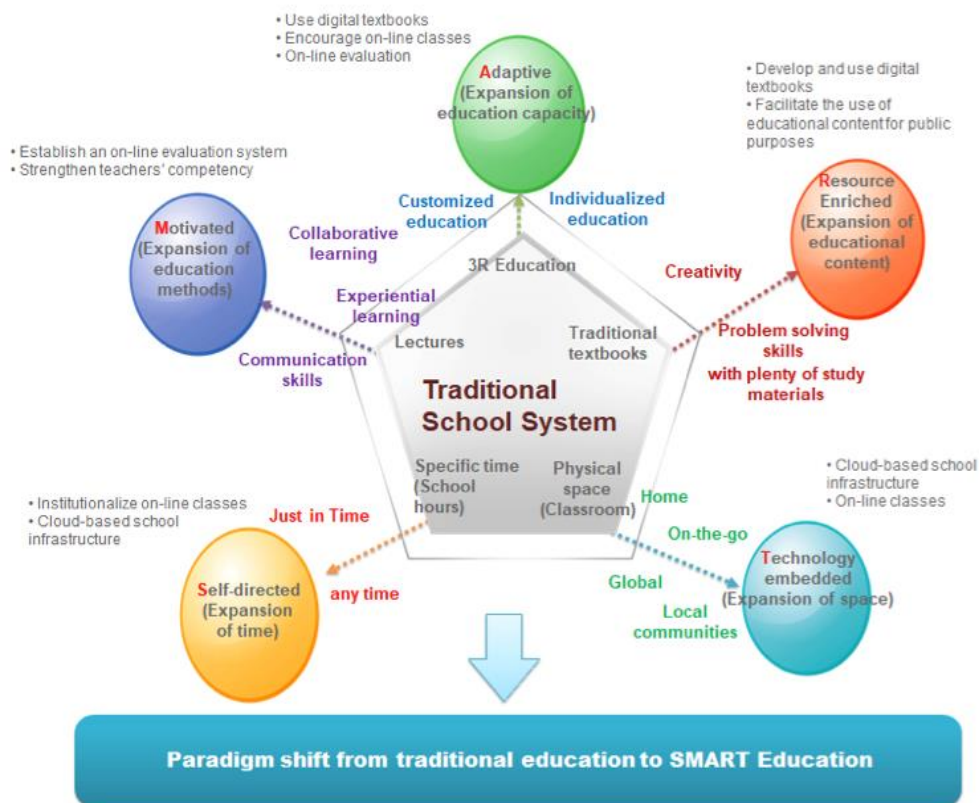
challenging to estimate what skills are required in the future. To meet the needs of constant societal change there is an increased demand for personalized learning and new technologies e.g. mobile devices, social media, gamification, augmented reality and big data (Fitzgerald et al., 2013). Society is becoming more individualistic and future learning environments will be tailored for every student (Santos et al., 2014), which creates challenges for higher education institutions to keep up with the ever changing technologies and trends of the pedagogical practices (Laurillard, 2013). The ultimate goal for personalized learning (PL) is to personalize individual's learning paths by supporting challenging areas of learning. According to Horizon Report 2019 (Educause) short-term key trends in higher education technology adoption are redesigning learning spaces and blended learning desing. Mid-term trends are advancing cultures of innovation and growing focus on measuring learning. Long-term main trends are re-thinking how institutions work and modularized and disaggregated degrees. Adoption of digital technologies has offered improvements in the quality and inclusion in higher education (Khalid & Pedersen, 2016).

Towards SMART Education

Finnish educational system is considered to be one of the most successful ones in the world and Finland has achieved PISA excellence in many years (Sahlberg, 2011). This can be as a result of many factors, such as the high quality of teaching and teacher training (Phillips & Schweisfurth, 2014). The core of Finland's success is the principled value of equity and an educational system that allows everyone to achieve high quality education despite their background (Kumpulainen & Lankinen, 2016). Digital learning enables equity and has become essential part of the education from elementary schools to universities. Today and increasingly in the future teachers need to widen their knowledge regarding digital learning and digital learning environments (Niemi et al., 2016). As Finland is one of the leading countries of technological development, it also provides an ideal environment for developing teaching alongside with technology (Spector, 2015).

In order to share lessons learned and to develop best practices of teaching excellence we focused on how to develop teaching excellence in the changing technology-enhanced learning environments. We chose to approach this topic through the SMART Education Framework (Chun, 2014). The framework represents the SMART (Self-directed, Motivated, Adapted, Resource enriched, Technology-embedded) education approach, focusing on the transition from traditional to digital school (see e.g. Jang, 2014). Thus, the approach expands the properties of the traditional school system to include capabilities enabled by the modern society.

Figure 1.

SMART: Definition & Objectives

Some examples of SMART Education development can be illustrated by the international project work in the faculty of information technology: European Union's FP7 co-funded IMAILE project focused on innovation in personalized learning environments (PLEs). IMAILE began in 2014 and finished in the Spring of 2017. IMAILE was the first Pre-Commercial Procurement project in Europe in the field of Education and Technology Enhanced Learning (Clements & Wallin, 2017). IMAILE's results show that PLEs developed in close contact with the users can take leaps of innovation faster than the market and the features developed this way have a chance to be more tailored to the users' needs. During 2017, IMAILE tested two innovative PLE prototypes in Swedish, Finnish, German and Spanish schools, gaining valuable user requirements straight from the grass-root level. One of the key goals of IMAILE was to develop technologies which would increase students' motivation towards STEM careers, as lack of motivation has been identified as an increasing societal challenge in Europe. According to IMAILE, learning analytics can be leveraged e.g. to inform students, teachers and parents about learning difficulties, as well as to provide automatic help to the students

preventing them from falling behind. The students also found the gamification elements of the two prototypes (badges, leaderboards, personalized learning paths) highly motivating and would like to have more control over their own learning in the future. In conclusion, digital solutions can be used to support the transition to autonomous future, which is approaching us e.g. in the form of smart phones and increased informal learning. However, there might be a need for an educational reform that makes learning a student-centered process, as opposed to the traditional teacher-centered approach.

The main objective of the STIMEY (Science, Technology, Innovation, Mathematics, Engineering for the Young) project funded by the European Union's Horizon 2020 research and innovation program (see Assaad et al., 2017) is to increase young people's interest towards studies and careers in science, technology, engineering and mathematics (i.e. STEM). The project focuses on the involvement of learners, educators, parents, and STEM professionals in the creation of attractive and engaging STEM learning environments (Mäkelä et al., 2017). For example, in one STIMEY substudy conducted in 2017, students, teachers, school directors, parents, and STEM professionals in project countries were invited in the participatory co-design of a hybrid (virtual, physical, formal, and informal) STEM learning environment. Amongst the most frequent wishes between different stakeholders in all countries were the connectedness between studies and the students' life as well as the use of diverse teaching methods such as collaborative and ICT-enhanced learning. The results have been used to create a pedagogical framework and design principles guiding the development of a hybrid learning environment including e.g. a social web platform, robots, serious games and entrepreneurial tools.

JYU has also been training teachers on digitalization in education as well as computational thinking, programming and robotics to get school teachers more aware of possibilities of technology. During the past two years JYU has collaborated with the local schools to address the digitalization of matriculation examination in upper secondary schools as well as programming and robotics in primary level. Different in-service training models have been offered to motivate and encourage teachers to adopt different teaching models, tools and applications for teaching. At first, the focus was on traditional training courses, but has since been expanded to more innovative models, such as hijacking schools and offering training in the actual workplace environment. Even though teachers have varying capabilities and different levels of motivation to move to the SMART way of teaching, adaptive need-based learning can be used to plan all in-service trainings, while providing support in the teacher's own classroom environments.

These experiences have shown that the paradigm change from traditional to SMART education is not without challenges. For example, moving to SMART education might require the teacher to leave their traditionally focused comfort zone, which requires courage from the teacher's side. The use

of pedagogical frameworks such as the SMART framework should be supported by proper tools and equipment and the user's needs should be addressed in research and development actions, taking into account both the education and the technology aspects. Based on the experiences, we can conclude that shifting from traditional education to SMART education requires placing attention towards five aspects of the framework: self-directedness, motivation, adoption, the resource enriched and technology embeddedness. As illustrated in the examples, various international research projects have been carried out to address the different dimensions of technology-enhanced education. Even though some European institutions may have a better basis than others for developing digital learning, it should be noted that this process is at its beginning even in the more technologically capable institutions. Additionally, the developments in basic capabilities are important steps towards the leveraging SMART education practices in the future. Thus, findings made by the projects can contribute to improving excellence in teaching in various cultural settings.

PETRA project to enhance digital teaching and learning

PETRA project is Erasmus + Action 2 Capacity building project promoting excellence in teaching and learning in Azerbaijan universities (573630-EPP-1-2016-1-ES-EPPKA2-CBHE-JP). University of Jyväskylä has been responsible for workpackage 5 together with Khazar university. The WP 5 aims to promote usage of learning technology in teaching and learning. The first deliverable was to organize workshops on e-learning and e-repository and the second deliverable was that Azerbaijani partner universities establish e-learning platform for example Moodle. The specific objectives were to develop teaching and learning process pedagogically and technologically to support teachers in order to improve quality of teaching.

In the beginning of the PETRA project the needs analysis was conducted among administration, faculty and students to understand better the premises of the project. Participated partners were Khazar University, Nakhchivan State University, Ganja State university, Sumgayit State University, Azerbaijan University of languages, Azerbaijan pedagogical university and one non-university. Regarding to the needs analysis azerbaijani higher education teachers were lacking skills of using ICT in teaching and modern interactive teaching methods. Analysis revealed that about 52% of teachers were not aware if there was online platform in their university and at the same time 23% of teachers had use them and 25% of teachers answered that there is no learning platform in their university. More than half of teachers had used online learning platform and almost half had sometimes used social media in their teaching. More than 40% had used audio or video lectures for their teaching and about 46% had utilized Power Point or Keynote. More than half (55%) had used email to communicate with students.

In PETRA project workshops on e-learning and e-repository were provided during the five day meeting in Jyväskylä, Finland. There were a wide range of experts sharing their knowledge of digital teaching and learning, institutional repository, Moodle, open science and purchasing databases. Two training were also arranged in Azerbaijan. The first training and workshop took place in Khazar university. The first training concentrated on digital pedagogy and how to plan online courses. At this state it was important to give practical advice how to get started with digital teaching. The second training was held in Ganja and it concerned digital competence of teachers, techno stress and Moodle basics as a reminder since the proper Moodle education was given in Jyväskylä. The goal of this training was to encourage teachers to start digital teaching by sharing experiences of Finnish teachers and knowledge of techno stress to increase understanding of teachers' possible resistance towards digital teaching. Khazar university has offered practical training and support to it-personnel to establish Moodle.

Results

According to the needs analysis conducted in the beginning of the PETRA project the situation with teaching and learning in Azerbaijani Universities was not favorable. Educational culture was strongly influenced by Soviet legacy and different cultures. Student-teacher relationship was not mutual and was based on students' obedience, listening and writing down the notes. Characteristic to the educational culture was that critical reflections and discussions of the lectures or materials were not supported neither welcomed.

During the PETRA project Azerbaijan partners established successfully Moodle or other learning platform in each partner university. In the future member universities planned to execute increasingly courses online. University staff participated on several trainings and workshops to enhance their capacity to meet the already existing and upcoming challenges of transfer from traditional teaching to smart education.

Discussion

Education transfer from traditional to smart education is not only about setting up learning platform and purchasing equipment. Digital transformation in education is a slow process that requires many years or even decades and it needs to happen in many levels of organization. The first premise is that teachers are properly trained to use digital tools and software and training would continue in regular basis. Staff of higher education institution should have continuous support if they meet any challenge according to digital teaching. It means both challenges with digital tools and digital pedagogy. This is a question about educational culture change from teacher led teaching to more collaborative learning. However digitalization in higher education is a

cultural change and needs to be strongly supported and strategically led by administration.

References

- 2020 *EDUCAUSE Horizon Report™* | Teaching and Learning Edition. 2019. Horizon report. Educause Publication.
- Assaad, M., & Mäkelä, T. (2017). Integrating Social Media Concepts as Tools in a Pedagogical Approach for a Technology-enhanced Learning Environment. In K. Daimi, & S. Semenov (Eds.), *AICT 2017: The Thirteenth Advanced International Conference on Telecommunications* (pp. 67-73). IARIA.
- Assaad, M., Mäkiö, J., Mäkelä, T., Kankaanranta, M., Fachantidis, N., Dagdilelis, V. Reid, A., Rioja-Del-Rio, C. Pavlysh, E.V., Piashkun, S. V. (2017). Attracting The European Youths to STEM Education and Careers - A Pedagogical Approach to a Hybrid Learning Environment. Conference: ICALT 2017: 19th International Conference on Advanced Learning Technologies, At Paris, France.
- Chun, S. (2014). *Pedagogical implications of Smart Education Initiative*. Presentation in University of Jyväskylä, 21.8.2014 (un-published presentation).
- Clements, K. & Wallin, E. (2017). *Innovations to Design Personalized Learning Environments for STEM Education of the Future?* 9th International Conference on Education and New Learning Technologies Barcelona, Spain. International Association of Technology, Education and Development IATED. ISBN 978-84-617-0557-3. International Association of Technology, Education and Development IATED.
- Einonen, P., Karonen, P., & Nygård, T. (2009). Jyväskylän yliopiston historia. In *Osa* (Vol. 1, pp. 1863-1966).
- FitzGerald, E., Ferguson, R., Adams, A., Gaved, M., Mor, Y., & Thomas, R. (2013). Augmented reality and mobile learning: the state of the art. *International Journal of Mobile and Blended Learning*, 5(4), 43-58.
- Jang, S. (2014). Study on service models of digital textbooks in cloud computing environment for SMART education. *International Journal of u- and e-Service, Science and Technology* 7(1), 73-82.
- Khalid M., Pedersen M. (2016). Digital exclusion in higher education contexts: A systematic literature review. *Procedia-Social and behavioral sciences*. <https://doi.org/10.1016/j.sbspro.2016.07.094>
- Kumpulainen, K., & Lankinen, T. (2016). Striving for educational equity and excellence. In *Miracle of education* (pp. 71-82). SensePublishers.
- Laurillard, D. (2013). *Rethinking university teaching: A conversational framework for the effective use of learning technologies*. Routledge.
- Mäkelä, T., Pnevmatikos, D., Immonen, H., Fachantidis, N., Kankaanranta, M., & Christodoulou, P. (2017). Considering Various Stakeholders' Views in the Design of a Hybrid Stem Learning Environment : Perceptions From Finland and Greece. In L. G. Chova, A. L. Martínez, & I. C. Torres (Eds.), *EDULEARN17 Proceedings*. 9th International Conference on Education and New Learning Technologies (pp. 5517-5526). IATED Academy.
- Niemi, H., Toom, A., & Kallioniemi, A. (Eds.). (2016). *Miracle of education: The principles and practices of teaching and learning in Finnish schools*. Springer.

Phillips, D., & Schweisfurth, M. (2014). *Comparative and international education: An introduction to theory, method, and practice*. A&C Black.

Sahlberg, P. (2011). PISA in Finland: An education miracle or an obstacle to change?. *CEPS Journal: Center for Educational Policy Studies Journal*, 1(3), 119.

Santos, O. C., Boticario, J. G., & Pérez-Marín, D. (2014). Extending web-based educational systems with personalised support through User Centred Designed recommendations along the e-learning life cycle. *Science of Computer Programming*, 88, 92-109.

Spector, J. M. (2015). *Foundations of educational technology: Integrative approaches and interdisciplinary perspectives*. Routledge.



© 2020 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).

Towards a Multidisciplinary Education for Engineers

Javier Orozco Messana¹, González-Pons A.M.²

Recommended citation:

Messana, J., O. & González-Pons, A., M. (2020). Towards a Multidisciplinary Education for Engineers. In G. Erdei, G. Pusztai, E. Juhász & J.O. Messana (Eds.), *Capacity Building and Development in Higher Education* (pp. 86-93). Debrecen, Debrecen University Press.

Abstract

Engineers are educated with significant technical depth in their chosen engineering discipline. Yet almost exclusively engineers work in teams made up of those educated in many different disciplines. And the design tasks that engineers face are becoming much more complex requiring engineers with a broader technical education to develop innovative solutions. Due to the increasing complexity of modern engineering projects, successful engineering leaders must have some degree of competence in more than one engineering field, and include a wider humanistic background. Educators should recognize that modern engineers require this diversity in technical skills, and should identify in engineering courses the “connections” in topics that are common to more than a single discipline. In addition, engineering students should be required to work in multidisciplinary teams before they graduate.

Keywords: Engineering education; Professional practice; Curricula; Classics.

Introduction

Most engineers today are educated in a handful of engineering disciplines such as: civil engineering, mechanical engineering, chemical engineering, and electrical engineering, to name a few. Civil engineers are concerned with the design and construction of various facilities such as transportation infrastructure, water and wastewater treatment infrastructure, buildings, and aerospace. Mechanical engineers are involved with the design of processes and machines for power production and application, including manufacturing, power generation, machinery, and HVAC (heating, ventilation, and cooling) systems. Chemical engineers utilize their technical knowledge, especially

¹ Universitat Politècnica de Valencia, Instituto de Tecnología de Materiales; jaormes@cst.upv.es

² Universitat Politècnica de Valencia, Instituto de Tecnología de Materiales; anamagonz@gmail.com

chemistry, to solve problems in chemical processing, food processing, chemical production, manufacturing, pharmaceutical production, polymers, biotechnology and many others. And electrical engineers work with electrical systems and devices, such as lasers, appliances, computers, power generation, and the like.

But engineers educated in these different engineering disciplines have similar job functions in that they address problems using their math and science backgrounds, and find technically viable, economically feasible solutions that benefit society. Civil engineers “build” solutions, mechanical engineers “manufacture” solutions, and electrical engineers “fabricate” solutions. And all engineers should be, concerned with the ultimate environmental impact of their “solution”.

The connecting theme for engineers of all disciplines is that engineers apply math and science “to develop ways to utilize economically the materials and forces of nature for the benefit of Civil engineers “build” solutions, mechanical engineers “manufacture” solutions, and electrical engineers “fabricate” solutions. And all engineers must be, or should be, concerned with the ultimate environmental impact of their “solution.” The connecting theme for engineers of all disciplines is that engineers apply math and science “to develop ways to utilize economically the materials and forces of nature for the benefit of mankind”. The scientific foundation of engineering is definitely changing from an amalgam of disparate scientific topics, to a more integrated body of knowledge.

There is less and less definition between the major scientific disciplines as time passes. And in practice, the engineering disciplines are far from segregated, as they must work together on complex projects. The knowledge that all engineers use may be more unified than educators portray in typical curricula.

If we consider the evolution of intellectual efforts in science, we can see the progression of science from the emphasis of the generalist to the emphasis of the specialist. As thinking during the Enlightenment gave way to Descartes’ reductionism (the analysis and study of the parts), great depth of knowledge in science was achieved. The engineering disciplines have also embraced the reductionist approach (Guntzburger et al, 2019), evident in the fact that we produce specialists in the individual disciplines with our undergraduate and graduate engineering programs. However, we may have lost sight of the big picture with this approach.

Increasing Complexity of Engineering Projects

The technology that engineers deal with is becoming more complex with the passage of time. Compare the elegant simplicity of the Ford Model T with the cars of today. Although most of the main systems remain in some form, albeit in a very advanced state, modern automobiles are much more sophisticated in that they are designed to travel at fast speeds, minimize damage and injury

during impact, minimize emissions, etc. Another example, the turbojet engine initially had only one moving part, but now has approximately 22,000 parts to achieve increased performance. In fact, it has been estimated that aircraft design teams are now composed of approximately 100 specialties. Although technological advancement has occurred, the increased complexity places more demands on engineers who are educated in narrowly focused disciplines (Khanna & Kumar, 2020)

This rapid increase in complexity, occurring at a rate of about 10^{106} times faster than biological evolution, is straining the ability of engineers with little sight of the big picture to get the more complex projects completed. And this change is not limited to large and rare projects; technologies considered complex comprised 43% of valuable world exports in 1970 and increased to 82% in 2015. New approaches for addressing these increasing complex design projects need to be researched and implemented, and future engineers must be able to function on these new design teams that by nature have members trained in many different disciplines.

In fact, oftentimes planned human actions may provide unintended results that are beyond the understanding of one type of scientist or engineer. Various environmental issues, such as the use of chlorofluorocarbons damaging the ozone layer, illustrate that innovation is “outstripping its ability to predict the consequences of its applications”. Many authors (Livotov et al., 2019) argued that the environment, being an interrelated complex system, cannot be understood through a reductionist research approach. Engineers with a broader technical education, particularly in environmental engineering and science, will be more aware of the “other consequences”.

Climate change is the worst undesired evolution from technological history that requires interdisciplinary knowledge and education, based on humanistic thought, for its correct study. The nature of sustainable development requires new paradigms for education. Issues of sustainability are ‘wicked problems’ that do not lend themselves to conventional didactic approaches but rather a team effort already depicted by Aristotle in ancient Greece. The challenge for higher education is to examine interdisciplinary approaches to global societal responsibility and, within this, integrate a humanistic approach for team development as the axis on education for sustainable development.

Facing environmental challenges, require a new attitude based on the development of the intellect and the broadening of the mind, afforded by a general knowledge of all the subjects of interest to the human race, as required to enable a man to intelligently attack and solve problems in which no previous detail experience guides, and to decide the questions arising in his intellectual, social, and industrial life by impartially weighing the different factors and judge their relative importance.

These problems, and thus the educational preparation required to cope with them, are practically the same in all walks of life, and the general

education of mind and intellect, required by the engineer, the lawyer, the physician, etc., thus is essentially the same. The only legitimate differences in the training for the life's work, required by the different professions, thus are those pertaining to the specific instruction and study of the details of the particular branch of human knowledge, by which the student desires to make his living. In other words, advanced engineering teams tackling sustainability problems should include these profiles and attitudes in their competencies and approach.

Multidisciplinary Sustainability Teams

As stated before, sustainability requires all engineering disciplines. In practice, sustainability problems are always addressed in groups made up of different disciplines and attitudes, and they need to function as a team to be most effective. Unfortunately, often the teams do not function coherently, partly due to the training of the team members which is discipline specific and limited.

Salter and Gann (2003) investigated the origin of innovative ideas in engineering design by surveying successful problem solvers at Ove Arup Partnership, a prominent international engineering firm. Ove Arup had a vision of “unity of all disciplines”, and this vision certainly helped create a successful innovative engineering company. But even with Arup’s vision, the new engineers were not all unified with respect to disciplinary knowledge. One notable quote by an engineer about new designers was: “They do not see the whole thing. They see one-eighth of the job. They look at it in isolation. Errors occur at the interfaces.” Could more diverse engineering backgrounds help designers address potential errors at the interfaces?

For ages the classics, were the foundation of all education, but in the last two generations it has been more and more pushed into the background by the development of empirical science and its applications. Neglect of the classics is one of the most serious mistakes of modern education, and concurrent interdisciplinary team education and research has demonstrated the need for classics in motivation and foresight. In the education of the engineer, more than in other professions, the absence of a classics approach is especially liable to make the man one sided.

Factors of a broad general education are very relevant for intellectual development. An introduction to classical thoughts is the best and quickest approach for a balanced mind. It is true that the classics are not necessary if the aim is to fit the student to technical skills. But such narrow focus on the engineering trade can hardly be called receiving an education, and certainly does not fit the man to intelligently perform his duties during the stormy times of industrial and social reorganization.

Freeman et al. (2019) as well as many other engineering educators, have emphasized the importance of creativity in engineering design. They support that engineering designers with different life experiences will provide more creative solutions. While diversity is most commonly thought of in terms of

race and gender, it should also be thought of in terms of background and experiences. A design team with members having widely varied technical backgrounds may be more creative as there will be a technically broader knowledge base to draw from. An individual team member with a broader background may provide a wider range of creative ideas and solutions as well.

Engineers of many disciplines are usually involved in most design projects. To be effective, the individual group members must function as a coherent team with some basic knowledge of the functions of the other individuals. Successful teamwork requires that each member of the team understands what the others are doing (Shore et al., 2001). This knowledge of the other disciplines may come from experience in design teams, or from educational experience. But some understanding of the other disciplines can bring about a more coherent approach as the design team has a more holistic basis for the design—the final design will not be a function of negotiations between disciplines.

Although there is effort to define the level and knowledge for the first professional degree in engineering (such as the MS), other professions such as law and medicine call for a broad education before specialization. Study in pursuit of a doctor of medicine degree typically lasts four years (subsequent to a BS or BA), of which there is usually relatively little specialization until the last year. Rotations are conducted in areas including pediatrics, internal medicine, orthopedics, psychiatry, surgery, such that there is some competence in more than one area. After specialization (e.g., surgery), the various doctors that may work in ad hoc or formalized teams will understand the others' technical language and skills, and maybe more importantly will know when to defer to another's expertise.

For example, consider a surgical operation involving MDs of different specialties and practices. Maybe a team of doctors of various specialties would diagnose a problem requiring surgery. One or more surgeons would perform the surgery, and an anesthesiologist would provide the anesthesia. There may be different medical specialties involved in the preoperation activities, the operation, and postoperation efforts. Nelson explained: "To a considerable extent these bodies of practice are different. On the other hand, each actor knows 'about' the skills of the other" (Shore et al., 2001). In addition to their own special skills, each has a broad understanding of medicine that was obtained, for the most part, from their education. They can function in efficient, life-saving teams like this because they have this broad education and understanding. Of course we want engineering teams to function in a similar fashion.

Leadership and Innovation in Engineering

Engineering educators and organizations strive to produce engineering leaders. The European Society for Engineering Education (SEFI) proposed that engineers have "an understanding of the role of the leader and leadership

principles and attitudes”. Engineering leaders are almost without fail extremely capable engineers in many areas, not just the one corresponding to their degree. And as leaders, they must be able to interact with and manage many different types of engineers. Yet subsequent to the math and science courses taken in the first couple years of an engineer’s undergraduate program, intellectual struggles for the most part are focused within a sole engineering discipline.

The various departments in universities are now given discipline-specific names like “the department of mechanical engineering” or “the department of chemical engineering.” But only universities use names such as these. Industry uses naming conventions for their departments that reflect a product or function of the department (i.e., “specific widget” design department), regardless of the engineering disciplines that make up the personnel in the department. And it is very rare for a department in industry to be composed of engineers of only one discipline. An ambitious engineer with an objective to achieve a leadership position in industry should have some degree of competence in more than just their own discipline. True technological leaders have been and are somewhat multidisciplinary in their technical knowledge as there are many specialties involved in the design and analyses of systems and components on complex machines like aircraft, submarines, and many others. The divergent specialties must converge into an effective design team, and a multidisciplinary leader can facilitate the effective development of the design team. A chief engineer must understand the big picture and organize the multitude of divergent tasks that have to be accomplished for such complex projects.

Thomas Edison, perhaps one of the most innovative inventors in history, saw the value of cross fertilization of somewhat disparate technologies in Menlo Park. His laboratories were arranged with dissimilar expertise in proximity and he asked the researchers to look for “strange combinations” (Fleming & Sorenson, 2003). And Richard Feynman, a Nobel Prize winner in physics, did not restrict his intellectual efforts to physics. He spent a sabbatical performing research in biology, studying bacteriophages, DNA mutations, and investigating ribosomes, and was invited to Harvard to present some of his findings in biology. His ability to apply his knowledge to other areas was further demonstrated in his active participation in the Space Shuttle Challenger accident investigation, a catastrophic and significant engineering failure. A leader in science and engineering should be able to transcend one discipline, as Feynman did.

Karl Terzaghi is known by many, particularly in civil engineering, as a pioneer in geotechnical engineering. He started out studying mechanical engineering in Austria, and eventually majored in civil engineering. He aspired to become an expert on dams, and wanted to become “one of the best” engineering geologists in Germany. To many, he is considered to have achieved his aspirations. Perhaps his greatest contribution to his field was his theory of consolidation of clays that was only formulated when he applied his

knowledge of heat transfer and thermodynamics. Through concepts in heat transfer and thermodynamics, he was able to envision the analogous application and solution. Although heat transfer is usually not a subject incorporated into a civil engineering curriculum, Terzaghi's interdisciplinary knowledge brought about a new understanding of clay consolidation.

Action for Engineering Educators

Clearly, it is not possible for graduating engineers to be educated in all major topics in more than one engineering discipline. But it may be important for engineering educators to take action to produce engineers with broader technical knowledge. One action that can easily be accomplished is to raise awareness in fundamental and engineering courses that the principles that are being applied in a specific course have applicability to courses in other disciplines, as recently suggested in a PISA report (2005).

Certainly this is accomplished by some already, but could be greater emphasized by others. Faculty in each discipline may be hesitant to attempt multidisciplinary discussions in their classes when they are not completely conversant in all aspects of other disciplines. But conceptual connections can be illustrated without having all the answers. It should be becoming easier for faculty to do this as there are an increasing number of academicians with multidisciplinary experience, and interdisciplinary programs. PhD students and postdocs in the sciences are using many avenues to get expertise in other disciplines, such as working in labs outside their fields, out-of-discipline courses, and multidisciplinary collaborations (Fleming & Sorenson, 2003). A continued exposure of engineering faculty to experiences outside of their own chosen discipline will most certainly provide faculty an opportunity to present multidisciplinary perspectives in classes.

For example, the topic of oscillations and vibrations is commonly seen as being part of the mechanical engineering curriculum. But it is a topic that has application in many other disciplines. In fact, atoms and molecules, the "building blocks" of the materials engineers work with, have periodic vibrations.

A significant educational component in design courses is the study of engineering failures, to ensure that those failures do not occur again. In a description of many notable engineering failures, including the Tacoma Narrows bridge failure, the Alexander

L. Kielland oil platform failure, and the collapse of the Hyatt Regency skywalks, Petroski discussed how these failures increased engineers' knowledge of design. A designer has to envision all ways that the subject of the design effort can fail. "Engineers increase their ability to predict the behavior of their untried designs by understanding the engineering successes and failures of history". Of course, engineering judgment and experience plays a very large role in this design ability. But by being cognizant of engineering successes and failures outside of one's main discipline will certainly enhance

an engineer's ability to avoid failure in design within their own discipline. Even if a direct connection cannot be made between a notable engineering failure and discipline-specific design with current scientific understanding, connections may be made by engineers in the future and may ultimately prevent a catastrophic failure. We need to can be done by educators discussing relevant failures from other disciplines in their discipline-specific design courses.

Disciplines have become increasingly divided, and academic departments frequently are disconnected from one another. The curriculum is fragmented, and the educational experience of students frequently lacks coherence. A multidisciplinary project can provide this "integrative component" in undergraduate programs. Universitat Politecnica de Valencia (UPV) in the degree of Building Engineering, requires that students complete a project, called the Interactive Qualifying Project (IQP), where they are exposed to broad topics in multidisciplinary teams. This project ensures that the students in different departments are not "disconnected" from one another. Other educators may want to consider an integrative project such as this at their institutions.

The IQPs are focused on a problem at the intersection of technology and society, and often address real-life problems through international project centers. They are the academic credit equivalent of three courses and are usually undertaken in the student's Junior year. And these projects almost always involve team members from more than one discipline, thereby providing a valuable multidisciplinary experience. It is a very successful way for students to achieve a broader technical education. And this project provides a great way for students to develop a comprehension of the effects of new technology in a global society, certainly important for all graduates.

A noteworthy IQP example is the ISAlab project run for 3 consecutive years (Orozco-Messana et al., 2020). It utilized scientific methods and practical applications to develop solid recommendations to improve the Valencia region sustainable performance. The project teams consisted of 3-5 students from different disciplines, with a faculty team as advisors from disciplines. This degree of disciplinary breadth is common with these projects and provides real life experiences necessary for engineers to function in these types of teams.

Of course the major principles within each major need to be stressed in education—engineers need to have depth of knowledge in their chosen discipline. And the engineering approach, or the thought processes that engineers go through in solving problems, must be emphasized in engineering education, as it is now. The engineering thought process is extremely important in all engineering disciplines, yet is not discipline specific. And a solid foundation for engineering judgment is crucial.

For example, ABET requires that engineering graduates have ability to use mathematics, but it is the interpretation of mathematical solutions that, in part, make up engineering judgment. It should be noted that a significant amount of

a physician's training is on diagnosis, which is a judgment call. Engineering thought processes and judgment remain the critical characteristics of engineers of all disciplines that provide for cohesion in engineering project teams. UPV's IQPs allow developing engineers to see that engineering judgment transcends their major.

Subsequent to engineering education when it comes time to practice engineering, the engineers that are produced in each major are thrust into multidisciplinary projects. There are few projects that an engineer will work on where there is only one type of engineer involved. UPV's IQP exposes students to more than one discipline during their engineering education. And they experience working in multidisciplinary teams. Through this experience, they may be able to communicate more effectively, and may better understand the big picture.

The multidisciplinary project experience in undergraduate education can go further than the IQP. Accreditation criteria include the requirement that graduates must be able to perform design within their discipline. For example, ABET specifies that civil engineering graduates must have "the ability to perform civil engineering design" obtained through experiences. Instead of a design experience completely within one's own discipline, it would be much more realistic and valuable if the design experience was within a multidisciplinary team. Some Senior design projects at WPI and other institutions are multidisciplinary, but it is not common and should be more widely considered. This is the way the complex systems, machines, and structures today are created and designed—in multidisciplinary teams. Civil engineers do not just work within a group of only CEs; and mechanical engineers do not just work with MEs—except during their education.

After graduation, all those within an engineering discipline must work with those of other disciplines. Engineering educators need to ensure that engineering curriculum reflects this, and a multidisciplinary Senior project would accomplish this. But to obtain significant technical broadening of an engineer's background, it may be necessary to consider lengthening the formal engineering education duration by requiring more credit hours, and require continuing education after the bachelor's degree. As science and technology become more complex and multidisciplinary, engineers who are comfortable with a broad range of concepts that may be outside of their own formal major will be the next engineering leaders shaping the future technology in the world.

The Future: A Trend to Unification of Knowledge to Address Complex Problems

For the future, scientists and engineers will need to better understand complexity. A recent report by the European Union on "Converging Technologies for Improving Human Performance" commented that "the ability to see complex systems at the molecular and atomic level will bring a New Renaissance" (Implementation strategy for Horizon Europe, 2020). But

whether or not a system is perceived as organized or chaotic is certainly dependent on the scale of observation. The scale-up of principles from atoms to bulk materials that engineers usually work with, will provide insight into how to deal with complex engineering problems, but will be a significant intellectual undertaking.

The increased complexity of designs that engineers are faced with demands that they have an understanding of complexity and scale issues. Unintended consequences and catastrophic failures of designs can occur when engineers do not see “the big picture.” Narrowly focused education can hinder the ability of engineers to approach complex design tasks. With “fresh” knowledge justified by a newly minted bachelor’s degree, the knowledge base of an engineer has an expected half life from 2.5 to 7.5 years. And the complexity of engineering challenges is increasing, pointing to the advantage of a broader understanding of engineering fundamentals from a wider range of disciplines. The engineer must adapt to new, more complex tasks where a wider knowledge of fundamentals are needed.

Yet real-life engineering endeavors are close to the intersection of the disciplines. Advancement in fundamental knowledge is now needed close to disciplinary intersections. The need and trend for unification of previously segregated knowledge in different disciplines has been noted by others. To obtain any degree of confluence and integration within the engineering profession, there must be some agreement as to the engineering principles that are considered to be overlapping and unifying.

Conclusions

Engineers graduate with technical understanding and expertise in one discipline, and are then thrust into real-life engineering projects that are, by nature, multidisciplinary. These increasingly complex projects need engineers with broad technical skills and knowledge. Educators can broaden engineers’ technical education through identification of conceptual similarities between seemingly diverse topics that may be covered by different engineering disciplines. And student projects can be undertaken in multidisciplinary teams during engineering education, instead of in single discipline teams as frequently is done now. UPV has developed a junior-level project, the IQP, where this multidisciplinary exposure is obtained.

Obviously discipline-specific topics must be covered in an engineering curriculum to produce technicians capable of entering the engineering workforce to do specific tasks. But as educators, providing a well-rounded technical education for our graduates and establishing connections between disciplines will help create engineering leaders. SEFI has supported the acceptance of the master’s degree as the first professional degree. If the engineering degree is to be considered a professional degree such as in law and medicine, we should produce graduates with greater multidisciplinary engineering capabilities.

References

- Guntzburger, Y., Pauchant, T.C. & Tanguy, P.A. (2019). Empowering Engineering Students in Ethical Risk Management: An Experimental Study. *Sci Eng Ethics* 25, 911–937. <https://doi.org/10.1007/s11948-018-0044-2>
- Khanna P., Kumar S. (2020). Engineering 4.0: Future with Disruptive Technologies. In: Rosa Righi R., Alberti A., Singh M. (eds) *Blockchain Technology for Industry 4.0. Blockchain Technologies*. Springer, Singapore.
- Livotov, P., Chandra Sekaran, A., P., Mas'udah, Law, R., Reay, D., Sarsenova, A. & Sayyareh, S. (2019). Eco-innovation in process engineering: Contradictions, inventive principles and methods. *Thermal Science and Engineering Progress*, 9, 52-65, <https://doi.org/10.1016/j.tsep.2018.10.012>.
- Gann, D., Salter, A. & Whyte, D. (2003). Design Quality Indicator as a tool for thinking. *Building Research & Information*, 31(5), 318-333, DOI: 10.1080/0961321032000107564.
- Freeman, G., Bardzell, J., Bardzell, S. & McNeese, N.J. (2019). The Innovation Ecology: Collaborative Information, Community Support, and Policy in a Creative Technology Community. In: Taylor N., Christian-Lamb C., Martin M., Nardi B. (eds) *Information in Contemporary Society*, 614-624. Springer.
- Shore, D. I., Spence, C., & Klein, R. M. (2001). Visual Prior Entry. *Psychological Science*, 12(3), 205–212. <https://doi.org/10.1111/1467-9280.00337>.
- Fleming, L. & Sorenson, O. (2003). Navigating the technology landscape of innovation. *MIT Sloan Management*, 44(2) 15-23.
- Orozco-Messana, J., de la Poza-Plaza, E. & Calabuig-Moreno, R. (2020). Experiences in Transdisciplinary Education for the Sustainable Development of the Built Environment, the ISAlab Workshop. *Sustainability*, 12, 1143.
- Unspecifield (2020). *Implementation strategy for Horizon Europe*. Retrieved from https://ec.europa.eu/info/horizon-europe-next-research-and-innovation-framework-programme_en (consulted April 2020).



© 2020 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).

The Significance of Engagement in Internationalization as Capacity Development in Higher Education

Ilona Dóra Dabney-Fekete¹

Recommended citation:

Dabney-Fekete, I. D. (2020). The Significance of Engagement in Internationalization as Capacity Development in Higher Education. In G. Erdei, G. Pusztai, E. Juhász & J.O. Messina (Eds.), *Capacity Building and Development in Higher Education* (pp. 94-104). Debrecen, Debrecen University Press.

Abstract

The present study aims at providing an overall summary of internationalization, and why it has grown to become a significant element for capacity development in higher education. It is worth noting, that capacity development is a factor that cannot be overlooked or treated lightly, since it has been forecasted to be a discerning characteristic of advancement in developing countries in the coming decades. As a result of the complex nature of capacity development, its comprehensive approach to planning, how it ought to consider local and global context at the same time, and the mode with which it is relational in attitude, makes this process valuable in a country's development, and vital for economic growth. A key factor in achieving economic growth and international competitiveness is knowledge, thus universities have a fundamental part to play in the given environment. Higher educational institutions stand at an important crossroads where, by training up the next generation to be proficient in capacity development, they can have a great impact. At the same time, as the world becomes more and more globalized, universities, their staff and students, as well as those shaping educational policy will want to participate in internationalization more fervently and readily.

Keywords: capacity development, internationalization, higher education, international cooperation, academic mobility

¹ University of Debrecen; fekeideid@gmail.com

Introduction

In the past couple of decades globalization has served as the background for certain radical changes in the world. It has created a new order, and with that a global uniformization and universalization trend has begun to envelope the world. Economies, cultures and societies have been connected and influenced by it, and as a result, higher education also bears the fingerprints of globalization. In many countries higher educational institutions, leaders and policy makers had to realize how great of an effect globalization has on the ways and modes universities obtain their goals. The process of getting engaged in this extensive process is not elective for these institutions, but rather both an urge or drive and an external pressure. Internationalization is seen as a possible response to the opportunities and challenges of globalization (Knight 2013; Knight–de Wit 2018; Dabney-Fekete 2020), and it is inevitably reshaping and forming the world of higher education.

While globalization provides the context for certain trends, is naturally occurring and, for the most part, moving forward unplanned, internationalization embraces all the policies and practices that academic systems have to set in motion in order to successfully face and overcome the global academic environment (Altbach–Knight, 2007), being very much an intentional effort and deliberate implementation. Along with „going with the flow”, which is partaking in globalization, as well as emphasizing internationalization, reestablished and new roles and obligations of universities are brought forth (Zolfaghari et al., 2009).

As a result of these newly (?) found duties and responsibilities, the international dimension has grown to be a crucial factor in the remodeling and challenging of the realm of higher education in the past four decades (Knight, 2008c). Despite the fact that some criticize (a few even question) the benefits and advantages of internationalization, saying that there are less romantic aspects of it (Jacob–Meek, 2013; Knight, 2013; Siekierski et al., 2018; Morley et al., 2018; Yang, 2020), and therefore it has to be investigated whether the change was for better or for worse (Knight, 2013), mostly it is agreed by scholars that connecting to the international scholar value-chain and purposely developing collaborations across borders can help in boosting quality in training by providing a basis for competitive knowledge that is measured in the international arena of higher education.

The internationalization “competition” at universities is thus characterized by the increased appreciation of non-material goods such as creativity, knowledge and social capital, which as consequently serve as promoters of development (Papanek, 2006). Academic mobility, as one of the most dominant factors emphasized by internationalization policies, and international collaborations, developing intercultural competence, networking, foreign language study, and introducing global aspects into teaching, undeniably adds to capacity development and world-class achievement (Jacob–Meek, 2013), even if the academic resources are somewhat moderate in a given country

(Jacob–Meek, 2013; Morley et al., 2018). And capacity development is a factor that cannot be overlooked or treated lightly, since it has been forecasted to be a decisive characteristic of advancement in developing countries in the next decades (Yeravdekar–Tiwari, 2014).

Capacity development in higher education

Capacity, the invisible and latent phenomenon

If capacity development plays such an important role in the growth of developing countries, then it is only fair to have a closer look and evaluate the often overused term of “capacity” in greater depth. All of the definitions that special literature offers, depending on the particular field of study and the specific research it occurs in, approach the phenomenon from different angles, thus creating several slightly diverging interpretations of the term. However, there are common attributes that can be spotted in all of them. They all include ability, skills or capability, and imply some kind of action, activity, effort, process or operation in order to achieve or accomplish something.

According to Brinkerhoff and Morgan (2010) capacity is a phenomenon that is both invisible and latent, thus it can only be detected when the actors put it to work in order to accomplish results. For that achievement an amalgam of collective capabilities, as well as individual competences, are needed, so that public value can be created by a human construct or organization (Baser–Morgan, 2008). Ubels and colleagues (2010) also highlight the fact that this occurrence has many sides to it, it addresses current problems and outcomes, it can take both abstract and palpable forms, and it tends to be political and relational by nature. In order for the human system to work, to sustain and update itself, to carry out first-class, compelling researches, knowledgeable and skilled people, shared implanted capabilities, along with resources that enable the system to develop and stay alive are needed, not to mention the ability to arrange, organize and synthesize all these factors (Baser–Morgan, 2008).

The United Nations Development Program (UNDP) in its definition of capacity indicates that it is an ability that applies to individuals, institutions, and societies “to perform functions, solve problems, and set and achieve objectives in a sustainable manner” (UNDP, 2010 p. 2). The South African Centre for Higher Education (CHE) also points out that capacity appears both on the human and institutional levels regarding their abilities to “think” and to “act” (CHE, 2005). While the former, “to think”, includes mental work like identifying problems, stipulating aims and goals, constructing strategies, finding explanations and solutions, as well as considering and evaluating experience and practice, the latter, “to act”, is all about the operation itself, during which certain skills and techniques are acquired and implemented along with policies and programs, and policies and experience are changed (CHE, 2005). It thus appears that essentially capacity can be understood at three

different levels (CHE, 2005 p. 20; Baser & Morgan, 2008 p. 13): the individual level, the level where capacity characterizes organizations, and the level that refers to the state or the public sector. Whatever the level, capacity is always related to performance.

A need for increased performance

Increased performance and achievement in developing countries' higher educational institutions are needed due to a number of changes that occur in the sector itself (van Deuren, 2013). The transformation of the higher educational arena is inevitable, and the world, in which higher education is a key player, is also subjected to substantial challenges and modifications (Knight, 2008c).

Van Deuren (2013) points out that one of the most important transformations is the accelerated expansion of the sector. The unprecedented growth started in the mid-20th century in many western European countries from the mid-20th century, and was still increasing almost a decade after the millennium – in 2000 there were about 98 million higher educational students in the world, and approximately 150 million only 7 years later (Altbach et al., 2009). In Hungary the massification started only after the political transition in 1990. Based on Trow's (2005) three-stage change theory in connection with higher education enrollment, the system shifts from elite to mass, then to universal higher education. In the elite system, admittance to universities is predominantly for the higher class, the benefit of quality education being determined by birth. In the massification phase higher education is no longer connected to birth privileges, but it is made available to everyone. A vast number of students enter universities, and, as a result, the inflation of qualification follows. Furthermore, as the introductory part of higher educational studies becomes more and more general, selection appears in later stages of the learning process, which makes it possible for even more students to enroll. Trow calls this universal higher education. In Hungary this particular phase was reached around 2000, only ten years after the country started to enter the massification phase. The rapid growth created problems that had an influence on higher education's internationalization as well.

Besides the massification of higher education, its growing socio-economic relevance that was brought about by the above mentioned phenomenon, also promoted a demand for increased performance. On the individual level, OECD (2012) claims, education serves as a profitable investment, especially during economically troublesome times. But it is a payoff for the society as well, since higher education is looked at as pivotal for any economy that wishes to dream bigger and be satisfied with more than just mere production processes. Well-educated and skillful workers are quintessential to such economies, who have the ability to evolve with the brisk transformation of their environments (World Economic Forum, 2010).

All these changes contributed to the need for increased performance in institutions of higher education. Along with the greater higher educational efficiency that society calls for, faster paced capacity development is requested in several spheres, like quality assurance, human resources, research and development, teaching and learning, governance, management, infrastructure, etc. (van Deuren, 2013). Simister and Smith (2010) made an attempt to describe capacity development by using an analogy. They explained it as a pebble thrown into the water – it creates ripples on the surface that, not only have an immediate local effect, but spread out and reach farther spots as well.

Capacity building or capacity development?

The ripple effect model (Simister–Smith, 2010) perfectly illustrates the perpetual and dynamic changing and moving nature of capacity development that is in constant communication and cooperation with the environment (van Deuren, 2013). It resonates with the culture and value system of its surroundings, and focuses on the process itself rather than solely on the results (CHE, 2005). But what is the difference, if any, between ‘capacity development’ and ‘capacity building’?

‘Capacity development’ is a term that occurs latterly, and it appears little by little to be replacing the earlier but still more broadly and generally used phrase, ‘capacity building’ (CHE, 2005). However, the two expressions are not the same, thus they cannot be used interchangeably, as each other’s’ synonyms of one another. Researchers (UNDP, 2008; Simister–Smith, 2010) argue that while ‘capacity building’ is more of an intentional series of planned intervention driven from the outside, ‘capacity development’ is more of an internal force that makes an attempt to build upon already existing national capacity (UNDP, 2008). As an internally induced effort, it rests upon beliefs, values, thoughts, attitudes and feelings. It contains changes regarding relationships amongst the actors, thus it is somewhat inconstant and unpredictable (Simister–Smith, 2010), requires adaptability, resilience and flexibility (van Deuren, 2013), and lacks the phony logic of “this is how it should work” (Ashcroft–Rayner, 2011).

Suggestions and general guidelines, on how capacity development does function or should operate do exist, however, since in many cases putting motives and objectives into practice can be rather challenging (Stephens, 2009). These include, but are not limited to, the following recommendations. First of all, it is very important to be familiar with and fully understand the local context, for there is no prescribed method to approach capacity development, thus becoming acquainted with local conditions and being open to new discourses are crucial (ECDMP, 2008; UNDP, 2008).

Meanwhile, one should be ready to welcome external support (Van Deuren, 2013; ECDMP, 2008), as they play an important role in bringing in new ideas, resources, and are able to create opportunities and discover new possibilities (ECDMP, 2008; Lopes–Theison, 2003). Having a long-term

mindset is also considered to be essential, but one should be working working towards short-term goals (De Grauwe, 2008; Jacob–Meek, 2013; Thomas–Peng, 2009; Lopes–Theison, 2003). Due to the ever changing nature of needs, another important thing to take into account, especially when working with individuals, is flexibility (van Deuren, 2013).

As a result of the complex nature of capacity development, its comprehensive approach to planning, how it ought to consider local and global context at the same time, and the mode with which it is relational in attitude makes this process valuable in a country's development, and vital for economic growth. A key factor in achieving economic growth and international competitiveness is knowledge, thus higher educational institutions have a fundamental part to play in the given environment (Salmi, 2009). At the same time, as the world becomes more and more globalized, universities, their staff and students, as well as those shaping educational policy will want to participate in internationalization more fervently and readily (Jowi, 2012).

Internationalization of higher education

Higher education internationalization - perceptions

Becoming actively involved in higher education's international activities is not a new phenomenon. However, it has increased at greater rates in the past decades, and the impact it has on higher education all over the world is undeniable and can appear in many forms. The term 'internationalization' itself is not a new phrase either, the field of political science has used it for a long time, while the education sector picked it up only in the 1980s (Knight, 2008c). Before this researchers referred to the occurrence as 'international education' or 'international cooperation', and today further terms like 'transnational', 'crossborder' or 'borderless' perplex people (Knight, 2008c; Zolfaghari, et al 2009). According to de Wit (2002) internationalization has become an umbrella expression for everything that is global, intercultural or international. He argues that this makes understanding the phenomenon way more complicated and due to being lost in the maze of terms, people tend to dress it up to express what they want it to indicate. We must then as ourselves: what exactly is exactly internationalization?

Many see it as a possible answer and reaction to globalization (Campbell–Gorgodze, 2016; Orosz–Perna, 2016; Knight–de Wit, 2018; Dabney–Fekete, 2020), thus becoming one of the most dominant influences that has a shaping effect on higher education (Knight, 2008a). In this process universities in general become both actors and reactors to the changes and difficulties that higher education faces and struggles with (Knight, 2008a). Others believe it is an unstoppable trend that can either be taken as a challenge that one can react to, or totally miss out on (Enders 2004; Buckner 2019). The countries may differ in how they act in response, which is mostly dependent upon the set-up

of the given state, along with how it wants to reach the goals it has set (Enders–Fulton, 2002).

Schoole and Knight (2013) see the challenge of defining the term in the fact that only a universal enough understanding could include the different diverse countries, cultures and their higher education system, and make their comparison possible. However, if a definition is “too” universal, it loses peculiar characteristics by which the phenomenon could be properly described and recognized. That may be the reason different people define the same phenomenon and experience varyingly, depending on the country, the region, the culture, the university, the education and internalization policies they follow, as well as on their priorities and resources at hand (Knight, 2008b; Knight, 2008c; Knight, 2012; Seehole–Knight, 2013; Orosz–Perna, 2016). Orosz and Perna (2016) argue that for understanding internationalization of higher education in a given region or country, it is key to examine the regional and national context as well. Based on all this, the internationalization of higher education can mean either a streak of international activities, or the transporting of education to other places with the help of methods and structures. Others look upon it as the incorporation of international and global aspects in the teaching and learning procedures, and for some it rather has something to do with development projects (de Wit, 2002; Knight, 2008c; Schoole–Knight, 2013).

The definition that we believe is the closest to our understanding of internationalization is that of de Wit and colleagues’ (2015), which is a refined interpretation of Knight’s (2008c): internationalization of higher education is “the intentional process of integrating an international, intercultural or global dimension into the purpose, functions and delivery of post-secondary education, in order to enhance the quality of education and research for all students and staff, and to make a meaningful contribution to society” (de Wit et al., 2015:29). Higher education can make that contribution through implementing policy, financing and planning (Zolfaghari et al., 2009).

The question inescapably arises: why would universities and governments be interested in promoting internationalization as a capacity developing factor? Why do they believe that internationalization could be the key to finding the solutions to current problems? What could be the reason for implementing deliberate and in most countries very well-organized national and international policies supporting this particular type of capacity development?

Subject to the particular country and its higher educational system, there could be several possible answers to these questions. However, it is without doubt that internationalization has grown into an industry, a means of earning a living, and a channel through which one can build up academic prominence (de Wit, 2020). It is also seen as an activity that predominantly exists to make profit (Wadhwa, 2016). Knight (2008c) calls the reasons for investing and engaging in internationalization rationales. She states that they are manifested in the policies and programs actualized and introduced. Knight and de Wit

(1995) differentiate between four groups of rationales: 1. political, which seems to be more crucial at the national level; 2. economic, which is probably more relevant in developed countries, 3. academic, which is mostly about obtaining world-class excellence and 4. social-cultural, which involves adapting to the changes globalization imposes on a country. Other reasons for internationalization could be developing human resources, enhancing mutual understanding and unanimity, economic competitiveness and growth, nation building, etc. (Knight, 1999). Although it would be an interesting research to examine how higher educational institutions juggle both the global aspect of its roles, and nation building (Buckner, 2019). Hayhoe suggests (1989) that among others the most significant reasons are international cooperation, mobility and scholarships, as well as political and historical background. De Wit (2002) adds academic quality assurance, curriculum development, international and intercultural understanding, recruiting international students, endorsing institution, and others to the list.

Gains, negative effects and dangers

Taking these reasons into consideration, it is clear to see why countries, institutions, and even individuals would seek to participate in the process of internationalization. For it is typically considered to be a constructive and good aspect of higher education (Marmolejo, 2010). From a survey carried out by the International Association of Universities in 2018, with the participation of 907 institutions from 126 countries, it was found that 36% of the respondents believe that internationalization enhances international cooperation and capacity building, and that it is responsible for the improved quality of education (Marinoni et al., 2019).

However, despite the benefits internationalization has, on the individual level, it evokes fear in many instructor, since it carries in itself the possibility of disappointment and disillusionment. Presenting one's scientific findings to an international academic community can be intimidating, for the number of (sometimes ruthless) critiques multiplies exponentially. It also raises concerns, namely that quality improvement is not the primary goal in many cases, that the benefits of internationalization are often exclusive to a small elite group, and that it is rather market-oriented, while it should be more committed toward contributing to society (de Wit, 2020).

Stohl (2007) finds the lack of commitment and motivation of university faculty to be the leading challenge to internationalization. He argues, that unless they are convinced that their everyday academic work will actually profit from taking part in international activities, and they can also see the results of it, they will choose not to be engaged. The same tendency was traced in a recent research (Dabney-Fekete, 2018) that sought to examine academic international activity on the individual level in two Hungarian higher educational institutions. Since academic cooperation has always been the characteristic of universities, even from the earliest appearances of them,

during which regular collaborations came into being to support, organize, seek out, process and pass down knowledge, it is for good reason that the questions arise: why are so many faculty members hesitant to step out into the international arena? What are the reasons for them to remain in the background? How can they be motivated? Could it be that due to the energetic and high-level transformations in higher education new patterns have developed regarding international activity and the motivations thereof? And finally, what internationalization type is the most favored?

Academic mobility, the most dominant factor in internationalization²

Internationalization can take many forms. One of the most researched is academic mobility, which is still the most determining factor of the phenomenon (de Wit, 2020). International academic mobility pertains to the teaching or research activity of higher educational instructors or researchers, which spans a couple of days or a few months, during which individual professional growth, capacity building, the establishment of international cooperation and networks, personal relations and friendships may develop. In higher educational institutions, personal academic progress and achievement is closely connected to internationalization. These are won through gaining collaboration experience via being a guest lecturer, attending conferences abroad, or winning scholarships and grants. Not only the individual, or the higher educational institution supporting them, benefits from the academic's international mobility, but also there are relevant social aims (O'Hara, 2009). On the one hand, due to the fact that instructors gain and share knowledge amid their academic mobility, they further broaden national scientific knowledge, a possible element of international competitiveness. On the other, the aforementioned knowledge that they acquired abroad can be translated into the national language and interpreted for national colleagues. Lastly, they can also be of influence on those forming the future academic elite and the decision makers (O'Hara, 2009; Dusa, 2017).

When we talk about international mobility from the aspect of economy, it is important to note the factors that are manifested as national economic interest. Numerous researches and studies are published on the forces enhancing economy, out of which several mention the accumulation of knowledge as the central-most force (Salmi, 2009). This manifests itself through the creation of new knowledge that is innovation, which is interactive by nature. Thus it is a procedure that uses the creativity, professional experience and past knowledge of the participants and is based on cooperation. Another important concept of international mobility examined from the economic side is the 'knowledge broker'. According to Simmel (1992) there

² This present section has been taken from the following article verbatim: Dabney-Fekete, I.D. (2020): *International Academic Mobility as a Capacity Building Factor in Higher Education*. Central European Journal of Educational Research, 2(1), 82-91. 10 p.

are certain social role players, driven either by their own or by a group's interest, who serve as mediators between individuals and groups who otherwise would never meet. They are known as brokers. Taking the theory of social capital and taking Simmel's idea one step further, the knowledge broker is someone who, by being a member of multiple communities, enhances the exchange of knowledge between the groups, promoting the creation of new knowledge and supporting changes (Kakihara–Sorensen, 2002; Meyer, 2010, Pusztai–Fekete et al., 2016). In Hungary, just like in other post-socialist countries, knowledge brokers played an important role during the political change. Politically active and at the same time educationally outstanding young academics had the chance to apply for a grant or scholarship to Northern European countries or the United States. They returned with the knowledge of how democracy works, and the acquired language skills lifted one part of them into high political, economic or academic positions after the Change of Regime (1989). This latter group brought with themselves the international theories, and research and publication practices (Pusztai–Fekete et al., 2016).

It cannot be denied that academic mobility enhances transcultural learning, communication technology, good research infrastructure, intercultural competences, professional prospects and future employability, problem-solving and decision-making capacity, and cultural and global awareness. Academic mobility has also grown to mean “visibility” on the international scientific stage: one can only be noticed if they appear at a forum where they can show what they have. It does not only bring strengthened research and teaching abilities, more and better academic outputs and publications but it also helps the instructor to improve language proficiency (Craciun–Orosz, 2018).

Conclusion

It is no question that globalization has had a massive impact on higher educational internationalization. Information revolution, the unprecedented developments in technologies, the increased flow of goods, people, services, ideas, values and belief systems, as well as the drift towards democratization and decentralization have all prepared the way for and sped up the dissemination of internationalization. It is a phenomenon that exposes universities to multitudes of challenges, hardships, opportunities and dangers demanding a myriad of reactions from higher educational systems and institutions. Universities play an important role in the 21st century's economies, since one of the engines of economic growth and international competitiveness is knowledge (Salmi, 2009). Scholars argue that internationalization's aspects of working together for a common good, as well as that of capacity development and academic mobility should be more emphasized in order to increase and advance the gains on national, institutional and individual levels (Knight, 2013; Jacob–Meek, 2013). As internationalization in higher education is seen as a reaction to globalization

(Knight, 2003; Knight, 2013; Knight–De Wit, 2018), and two of its dominating factors, international cooperation and academic mobility, are essential for a country's capacity development and world-class academic excellence, it should be evident that governments, institutions and individuals will want to invest in it. All in all, as the world's economies move and change with time and the tides of political and financial interest, it can be predicted that the academics of more and more nations will step out onto the international stage. This emboldening will fuel capacity development in higher education, thus driving those home countries' economies to higher, ever higher levels of prosperity.

References

- Altbach, P. & Knight, J. (2007). The Internationalization of Higher Education: Motivations and Realities. *Journal of Studies in International Education*, 28.
- Altbach, P. G., Reisberg, L. & Rumbley, L. E. (2009). *Trends in global higher education. Tracking an academic revolution*. Paris, UNESCO. Retrieved from <http://graduateinstitute.ch/webdav/site/developpement/shared/developpement/cours/E759/Altbach,%20Reisberg,%20Rumbley%20Tracking%20an%20Academic%20Revolution,%20UNESCO%202009.pdf>.
- Ashcroft, K. & Rayner, P. (2011). *Higher education in development. Lessons from Sub-Saharan Africa*. Charlotte, Information Age Publishing.
- Baser, H. & Morgan, P. (2008). *Capacity, change and performance*. Study report. (ECDPM Discussion paper 59B) Maastricht, ECDPM. Retrieved from http://www.ecdpm.org/Web_ECDPM/Web/Content/Navigation.nsf/index2?readform&http://www.ecdpm.org/Web_ECDPM/Web/Content/Content.nsf/0/BD2B856F58D93E5FC12574730031FD6F
- Brinkerhoff, D. W. & Morgan, P. J. (2010). Capacity and capacity development: coping with complexity. *Public Administration and Development*, 30, 2-10.
- Buckner, E. (2019). The Internationalization of HE: National Interpretations of a Global Model. *Comparative Education Review*, 63(3) .
- Campbell, A., & Gorgodze, S. (2016). Internationalization of Georgian higher education: National and international influences. *Hungarian Educational Research Journal*, 2006/1.
- CHE (Council on Higher Education) (2005). *Towards a Framework for Quality Promotion and Capacity Development in South African Higher Education*. South Africa. Retrieved from <http://www.che.ac.za/documents/d000113/>
- Craciun, D. & Orosz, K. (2018). *Benefits and costs of transnational collaborative partnerships in higher education*. Luxembourg: Publications Office of the European Union.
- Dabney-Fekete, I. D. (2018). *Oktatók tudományos együttműködésének hálózatai a felsőoktatásban*. [Academic Networks of Cooperation of Instructors in Higher Education]. Doctoral dissertation. University of Debrecen.
- Dabney-Fekete, I. D. (2020): *Nemzetköziesedő tudomány – Felsőoktatásban dolgozó oktatók tudományos aktivitása*. [Academics Internationalizing – The academic activity of instructors working in higher education.] Debrecen, CHERD-H, 198 p.

- De Grauwe, A. (2009). Without capacity, there is no development. UNESCO/IIEP. Retrieved from <http://unesdoc.unesco.org/images/0018/001870/187066e.pdf>
- De Wit, H. & Hunter, F. & Howard, L. & Egron-Polak, E. (2015). Internationalisation of higher education. Directorate-General for Internal Policies.
- De Wit, H. (2002). *Internationalization of Higher Education in the United States of America and Europe: A Historical, Comparative, and Conceptual Analysis*. Westport, CT: Greenwood Press.
- Dusa, Á., R. (2017). *A hallgatói mobilitás mint a nemzetköziesedés célja és eszköze*. [International student mobility as the goal and tool of internationalization.] University of Debrecen HTDI. Doctoral dissertation.
- ECDPM (2008). *Capacity Change and Performance: Insights and implications for development cooperation*. (Policy Management Brief No. 21). Maastricht: ECDPM. Retrieved from <http://www.ecdpm.org>
- Enders, J. & Fulton, O. (2002). Blurring Boundaries and Blistering Institutions. In Enders, J. & Fulton, O. (Eds.). *Higher Education in a Globalising World*. London: Kluwer Academic Publishers.
- Enders, J. (2004). Higher education, internationalisation and the nation-state: Recent developments and challenges to governance theory. *Higher Education*, 47(3), Springer.
- Hayhoe, R. (1989). *China's universities in the open door*. Armonk, NY. <http://chronicle.com/blogs/worldwise/internationalization-of-higher-education-the-good-thebad-and-the-unexpected/27512>
- Jacob, M. & Meek, L. (2013). Scientific mobility and international research networks: trends and policy tools for promoting research excellence and capacity building. *Studies in Higher Education*, 38(3), *Research Universities: Networking the Knowledge Economy*.
- Jowi, J. O. (2012). African universities in the global knowledge economy: the good and ugly of internationalization. *Journal of Marketing for Higher Education*, 22(1), 153-165.
- Kakihara, M. & Sorensen, C. (2002). Post-modern professionals' work and mobile technology. Paper presented at the 25th Information Systems Research Seminar in Scandinavia, Copenhagen Business School, Frederiksberg, Denmark.]
- Knight, J. & de Witt, H. (1995). Organization for Economic Co-operation and Development, Organization for Economic Co-operation and Development. Secretary-General & Programme on Institutional Management in Higher Education. *Quality and internationalization in higher education*. Paris: Organization for Economic Co-operation and Development.
- Knight, J. & de Witt, H. (2018). Internationalization of Higher Education: Past and Future. *International Higher Education*, 95, Fall: *Internationalization and Transnational Developments*.
- Knight, J. (1999). Issues and trends in internationalization: A comparative perspective. In S. Bond, J. P. Lemasson & International Development Research Centre (Canada). (Eds.). *A new world of knowledge: Canadian universities and globalization*. Ottawa: International Development Research Centre, xii, 294.
- Knight, J. (2008a). An Internationalization Model: Meaning, Rationales, Approaches, and Strategies. Higher Education in Turmoil – The Changing World of Internationalization. *Global Perspectives on Higher Education*, 13.

- Knight, J. (2008b). Internationalization around the world: the results of a Global Survey on the international dimensions of Higher Education. *Global Perspectives on Higher Education*, 13.
- Knight, J. (2008c). The Internationalization of Higher Education: Complexities and Realities. In Teferre, D. & Knight, J. (Eds): *Higher Education in Africa: The International Dimension*. Ghana, Boston College – CIHE, Association of African Universities.
- Knight, J. (2012). Student Mobility and Internationalization: Trends and Tribulations. *Research in Comparative and International Education*, 7(1).
- Knight, J. (2013). The changing landscape of higher education internationalisation – for better or worse? *Perspectives: Policy and Practice in Higher Education*, 17(3).
- Lopes, C. & Theison, T. (2003). *Ownership, leadership and transformation. Can we do better for capacity development*. London: Earthscan/UNDP.
- Marinoni, G., Egron-Polak, E. & Green, M. (2019). *A changing view of the benefits of HE internationalisation*. University World News.
- Marmolejo, F. (2010). *Internationalization of higher education: The good, the bad, and the unexpected*. *Chronicle of Higher Education, WorldWide Blogs*
- Meyer, M. (2010). The Rise of the Knowledge Broker. *Science Communication*. SAGE Publications, 32(1).
- Morley, L. & Alexiadou, N. & Garaz, S. & González-Monteagudo, J. & Taba, M. (2018). Internationalisation and migrant academics: the hidden narratives of mobility. *Higher Education*, 76.
- O'Hara, S. (2009). Internationalizing the Academy: The Impact of Scholar Mobility. In Bhandari, R. & Shepherd, L. (Eds): *Higher Education on the Move: New Developments in Global Mobility*. New York: HE.
- OECD (2012), "What Are the Returns on Higher Education for Individuals and Countries?", *Education Indicators in Focus*, 6, OECD Publishing. DOI 10.1787/5k961l69d8tg-en.
- Orosz, K. & Perna, L. (2016). Higher Education Internationalization in the Context of Ongoing Economic-Political Transitions: Insights from Former Soviet and Eastern Bloc Nations. *HERJ Hungarian Educational Research Journal*, 6(1).
- Papaneke, G. (2006). *Tudásáramlás, jogbiztonság, együttműködés: A magyar gazdaság fejlődésének láthatatlan forrásai*. [Knowledge flow, legal certainty, cooperation: The invisible sources of the development of Hungary's economy.] Budapest: Aula Kiadó.
- Pusztai, G., Fekete, I. D., Dusa, Á. R. & Varga, E. (2016). Knowledge brokers in the heart of Europe: International Student and Faculty Mobility in Hungarian Higher Education. In Orosz, K. & Perna, L. (Eds). *Higher Education Internationalization and Economic-Political Transitions*. *Hungarian Educational Research Journal*, 6(1). Debrecen: Debrecen University Press.
- Salmi, J. (2009). *The challenge of establishing world-class universities*. Washington, Worldbank.
- Sehoole, C. & Knight, J. (Eds) (2013): *Internationalisation of African Higher Education*. Sense Publishers.
- Siekierski, P., Lima, M. C. & Borini, F. M. (2018). International Mobility of Academics: Brain Drain and Brain Gain. *European Management Review*, 15(3).

- Simister, N. & Smith, R. (2010). *Monitoring and Evaluating Capacity Building: Is it really that difficult?* INTRAC Praxis Paper 23. Retrieved from <http://www.intrac.org/data/files/resources/677/Praxis-Paper-23-Monitoring-andEvaluating-Capacity-Building-is-it-really-that-difficult.pdf>.
- Simmel, G. (1992). *Conflict and the Web of Group Affiliations*. Translated and edited by Kurt Wolff. Glencoe, IL: Free Press.
- Stephens, D. (ed.) (2009). *Higher Education and International Capacity Building: Twenty-five Years of Higher Education Links*. Symposium Books.
- Stohl, M. (2007). We Have Met the Enemy and He Is Us: The Role of the Faculty in the Internationalization of Higher Education in the Coming Decade. *Journal of Studies in International Education*.
- Thomas, S. M. & Peng, W-J. (2009). Enhancing Quality and Capacity for Educational Research. In Stephens, D. (Eds.). *Higher Education and International Capacity Building: Twenty-five Years of Higher Education Links*. Symposium Books.
- Trow, M. A. (2005). *Reflections on the transition from elite to mass to universal access: forms and phases of higher education in modern societies since WWII*. In: *International handbook of higher education*. Retrieved from: <http://escholarship.org/uc/item/96p3s213>
- Ubels, J. J. & Acquaye-Baddoo, N. & Fowler, A. (2010). *Capacity Development in Practice*. London: Earthscan.
- UNDP, (2008). *Capacity Assessment*. Practice Note. New York, United Nations Development Programme.
- UNDP, (2010). *Capacity Development. Measuring Capacity*. United Nations Development Programme, Capacity Development Group, Bureau for Development Policy.
- van Deuren, R. (2013). *Capacity Development in Higher Education Institutions in Developing Countries*. Working Paper No. 2013/30. Maastricht School of Management.
- Wadhwa, R. (2016): New Phase of Internationalization of HE ad Institutional Change. *Higher Education for the Future*.
- World Economic Forum, (2010). *The global competitiveness report 2010 – 2011*. Geneva, World Economic Forum.
- Yang, R. (2020). Benefits and challenges of the international mobility of researchers: the Chinese experience. *Globalisation, Societies and Education*, 18(1) Special Issue: Promoting global cities status: talent attraction and retention in Asia.
- Yeravdekar, V. R. & Tiwari, G. (2014). Internationalization of Higher Education in India: Contribution to Regional Capacity Building in Neighbouring Countries. *Procedia – Social and Behavioral Studies*.
- Zolfaghari, A., Abran, M. S. & Zolfaghari, A. (2009). Internationalization of Higher Education: Challenges, Strategies and Programs. *US-China Education Review*, 6(5).



© 2020 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).

Practice of excellence to improve learning and teaching in higher education

Krisztina Győri¹

Recommended citation:

Győri, K. (2020). Practice of excellence to improve learning and teaching in higher education. In G. Erdei, G. Pusztai, E. Juhász & J.O. Messana (Eds.), *Capacity Building and Development in Higher Education* (pp. 105-116). Debrecen, Debrecen University Press.

Abstract

In the competitive situation of the 21st century the pursuit of excellence in higher education is living its heyday. More and more practical implementations are made, which goal is to improve the efficiency of learning and teaching. The goal of this study is to provide comprehensive knowledge about the most widely known excellence programs that help learning and teaching, which between others are the STC, the TLC and the EFQM. The literature report about many TQM inspired initiative from the beginning of the 2000s to the present day. After the literature review, pondering the positive and negative features I come to a conclusion that the excellence in higher education can provide success if the organization is congruent to its principles, in addition to be committed in the way of monitoring and correction.

Keywords: Higher Education, Excellence, STC, TLC, EFQM, Teaching and Learning

Competition in a knowledge-based society

In our knowledge-based society it has become an expectation, that a school not just mediate knowledge, but to be able to teach the students to learn. In the European Union's educational strategy to acquire the ability of autonomous learning is mentioned as a keycompetence, which is closely connected to the lifelong learning. The term of lifelong learning at the beginning meant that the person in his/her life had to acquire more professions in order to be successful. Today this meaning is supplemented with the development of skills and competencies, furthermore it means a comprehensive guideline for all regions of education, state, economy and citizens alike (Making a European Area of

¹ University of Debrecen; gyorikrisztina97@gmail.com

Lifelong Learning a Reality, 2001; Higher Education Conference of Montreal, 1960).

The P21, which was made by the United States' Ministry of Education, formulate requirements for similar competencies and skills (P21: Partnership for 21 Century Learning). This framework mentions skills, that are relevant in the 21th century, which should be implemented in education. Between these skills, the learning and innovational skills are highlighted (recd. P21 2009).

The learning demands of the „21th century's human” unfold it's effect over the public education to higher education as well. This higher educational expectations, which emphasize marketability, enhanced the concept, that the student is like a „client”, who makes transaction with the university in order to improve his/her human stock. This is why universities are competitors to each other, in that which institute can produce more marketable „products” (Gourlay & Stevenson, 2017). The higher educational expansion means further severity in the demand of excellence. The European Union set an aim to achieve in 2020, that the 40% of its citizens with 30-34 years will possess higher educational qualification. Fallis report of an even larger demand in numbers, that in North-America the demand for professionals with higher educational qualification will be 70% by the forecast (Polónyi, 2014). That is why the place of universities in the international ranking is more important than ever, for the employees and for the leaders as well. The establishment of the ranking is made by how many and how qualified instructors and students does the university possess. It is important to mention that, the creators of this rankings– similarly to the universities – are competing with each other too (Török, 2006).

Excellence in higher education

Thanks to all these economical demands the organizations with quality assurance (QA) appeared in higher education too. But what is excellence? The „excellence” has many meanings. According to the research group of ENQA excellence is essentially a social phenomenon, which is based on conceptual and cultural considerations, that can contain the application in management and the development in technological context in itself as well. The use of excellence's term, thanks to the quality enhancing effects in organizations and education, in the past years became popular in higher education too. In the higher education's relations however we must not forget about the regulations of quality education, namely in this context excellence contains the skills of students, the quality of education, the scale of educational resources' assurance, finally the studental success. To measure all these factors various monitoring systems were made, that essentially possess two functions. On the one hand they improve the institutes and their programmes, on the other hand enhance the accountability of educational and learning results (Brusoni et al., 2014).

In the light of this, more and more university from all over the world avow the principles of excellence. Brent Ruben (2007) reported about the american

excellence program in higher education. The american framework is based on the approach integration of planning, assessment and improvement. The framework examine seven area of assessment and with that it defines the quality of higher education: leadership; aims and plans; beneficiaries and constituencies; programs and services; faculty, staff, and workplace; assessment and information use; outcomes and achievements. The speciality about this modell is that it can be used in any higher educational institutes, moreover in civil service, or in organizations of service and education as well.

In 2015 and 2016 the United Kingdom published two documents, which urge the establishment of „educational excellence system” in order to enhance the quality of education. This all allows that in the function of their results later they can raise the school fees. In addition the „placing students in the center” initiative has appeared, in which improving social mobility is one of the key factors (Gourlay & Stevenson, 2017).

Among others, in the Russian higher education started an initiative of excellence in 2013 (5-100. Project), which aim was that five leading Russian higher education institute is to be mentioned in the WURs world rankings in 2020. To achieve this, the government supported 21 russian universities to maximalize their competitiveness (Tsvetkova & Lomer, 2019).

Above these examples there are many other initiatives of excellence in the literature. However the question can occur about with which organizational and educational strategies could the initiatives of excellence achieve excellence, furthermore how succesfull they can be? In the following section I'm looking for the answers through several programs.

Practice of excellence to improve the efficiency of learning and teaching

Student-Centered Learning (SCL)

The Student-Centered Learning, as it is deducible from its name, essentially places the student in the center during education in order to achieve improvement in learning and teaching alike. In her study, Gloria Brown (2011), introduced the possibilities of student centered learning, through the book of „Learning-Centered Teaching” written by Maryellen Weimer. Weimer (2002) reported in her book, that the institutes of higher education are essentially instructor centered, which discourage the students in becoming more excellenet and more successfull. This phenomenon has become clear to the instructors too, and that is why student-centered initiatives came to be. According to Weimer on behalf of student-centered eudcation five areas are needed to be in the center of attention: balance of authority; function of content; the teacher's role; responsibility of learning; aim and progress of assessment. In the following sections these five areas were explained by the author and she suggested relevant solutions for them.

According to the experience of Weimer (2002), the decision is essentially in the instructor hand, which is accepted and demanded for congruency by the

students. In her opinion today's university and college students are mostly cautious, rather than self-confident. In order to help students to achieve self-confidence the instructors have to share their authority with the students from the beginning, for example: to provide a list about the tasks, from which the student can choose from. Tyma (2009) within the confines of a course gave a chance for the student to share the authority. After a collective brainstorming three possibilities were proposed, followed by a disputation, finally the students voted about the frameworks of the course. Thanks to these initiative the ideas were essentially due to the instructors outlining a ruleset for the students, moreover with the involvement they managed to create a progression-plan, communicational and assessment system, which proved suitable for both parts (Brown 2011).

Mentioning the function of content, Weimer (2002) concluded that the educational materials often lead to neglect in the subject's aim orientation. That is why she conceive it important that a good course is not equal to a strict course. As a conclusion when the students face high amount of content, their goal will be memorizing, which will lead to a less amount of knowledge. She wants to raise the attention to that the instructors should not be lead by a self-aimed content-centered education when they plan their course, but use the course as a tool to help the students to acquire the educational materials. She suggest that if the instructor apply these in practice, then he/she could induce the acquisition and development of such skills like the skill of learning, critical thinking, and problemsolving. To achieve this Brown (2011) made several suggestions. She report about two student-centered models, which were tested in a higher education of music. One of them was that when during a course (Comprehensive Musicianship through Performance/CMP) the students had the opportunity to examine and get to know the chosen piece and through that supplement the instructor's work with their own ideas. The second was included in the Arts PROPEL program, in which the students' knowledgeimprovement was aided by metacognitive reflections along with the acquisition of the course's content.

It might seem as a paradox, but in the student-centered education the role of the instructor is a key component. In the progress of learning most of the activities are made by the instructor, because he/she chooses and organizes the content, the interpretations and uses of terms, and the assessment of students. The task of the students is to note the given knowledge. That is why the role of the instructor has to change in a student-centered context. The instructor has to lead the students towards the knowledge, not just „fill” them with it. Baxter and Gray (2001), and Tärnvik (2007) are in a similar opinion about the rolechange. One practical example is when the student's presentations become part of the course. A further example is a popular workorganizational solution, during which the students present the educational materials to each other in five-minutes presentations, which later a disputation follows, and the instructor come into a support-moderator role (Brown, 2011).

Weimer's book (2002) draws attention to the responsibility of learning as well. In her opinion an omission obviously have to be followed by a consequence, however she expressly criticizes those rules, that demotivate the students. It is not doubtful, that the students are in need for structured work and a certain level of achievement-compulsion to improve their commitment to learning. It is a generic characteristic, that students tend to achieve good graduation, and if they can't reach that goal, they blame it on the instructor. The student-centered systems can provide solution to this phenomenon as well. It enables the students to monitor their knowledge as the instructors expect activity from them during the learning progress (Brown, 2011). In her study Kennedy (2009) concluded that when they partake in disputations, the students' performance level has increased significantly (from 75% to 85%). With the digitalization of the education, several initiatives, which used new technology, were created to help the monitoring.

One example for this is the We!Desing (Triantafyllakos et al., 2008) educational software. With the help of We!Desing they created a method that utilize the students' ideas, and through that achieved the conformance of the generated educational programs for the students. These applications can help the students in the making of notes, furthermore in achieving higher cognitive skills. Another educational software the Just-In-Time (Novak, 2011). The software was originally made for physics courses in university, but nowadays it is widely used in scientific and non-scientific areas as well, enabling the instructor to create online „warm-up questions” for the students. The success of the quiz reside in that the students not just read the questions and answer them, but during learning they connect the acquired knowledge to their prior knowledge, then with the help of their new knowledge they solve the difficulties set before them. The JiTT is even capable of connecting the place of teaching through continuous feedback with every other learning environment, that the students use (Brown, 2011).

The last substantive point in Weimer's book (2002) is to place the aim and progress of assessment in a new perspective in a student-centered context, because the assessment should not be just performance converted into points, but it has to result in the developement of learning. These all leads to a change in the aims of subjects and learning progress, because the students are taught how to assess their own and their partners work with the formulation of critical and constructive questions. The student-centered assessment's another positive consequence is that it can help to reduce the amount of studental anxiety and cheat attempts. To achieve this the requirements for completing the course have to be clear for the students as well. There are several practical and theoretical examples for the learning supportive assessment in the literature: According to Kain (2003) the student-centered courses have higher chance in being successfull even by their positive effects on the satisfaction and motivation of students. Knight and Wood (2005) percieved that the frequent feedback within a group effectively supports the progress of learning. Lu et al

(2007) raised awareness about the application of the wireless online education; furthermore Kemm and Dantas (2007) urge the system of e-learning. Brown (2011) further add more success-motivational examples, like the participation in projects and mutual programs after school. For the student-centered assessment methods, the literature mentions several proposals. One example is the Learner-Centered Micro Teaching (LCMT), during which the Turkish in-service teachers' teaching were assessed. The in-service teachers who took part in the research, were tested in advance, without control group. The aim of this study was to procure development with assessment in the main professorial competencies (expertise, planning, progress of teaching, organization, communication, selection of the educational materials). As a result of applying the LCMT model there was a tendency of development in the previously described competencies (Kilic 2010). Another possibility for student-centered assessment was made by Shu-Hui and Smith (2008), who created the assessment system called the Students' Perceived Interaction Survey (SPIS), which was used in distance education. According to their study the teacher-student relationship, the properties of WebCT, furthermore the gender of students had the utmost effect on the students' course satisfaction.

Teaching and Learning Center (TLC)

A specifically popular excellence initiative along the Student-Centered Learning is the TLC systems, that are independent university units, and their main task is to support excellence in educational institutes, while improving its organizational structure at the same time. Furthermore the TLC provides programs, services and events (consultation services, workshops, newsletters etc.), that can help to achieve educational research in practice, and innovation as well (Verma-Nelson, Hundley & Tarr, 2012; Frantz et al., 2005).

The point of the TLC's methodology is to achieve the most successful instructorial work through intervention, which is initiated in a higher educational institute by three essential methods: contact, education and assessment. For the contact system there are some examples as recommendation: libraries, IT services or even initiatives aimed at learning technologies. As for the education mostly consultations, coaching, workshops, seminars and guest experts should be provided. Finally for assessment there are several opportunities provided by the TLC system. As examples there are student measuring, focus groups, class observations, assessment of critical thinking, and instructor measuring. Besides it supports assessment – if the institute requires it – through the international system of the National Survey of Student Engagement (NSSE). All of this can be useful for the institutes to specify the essential changes for their own development in relation to the international scale (Nadler et al 2012, p. 10).

The efficiency of the TLC systems thanks to its very mature model and high potential, are exposed to continuous criticism. That is why the researchers are often looking after environmental features, where this excellence initiative

could adequately achieve success. In their study Frantz et al. (2005) investigated several TLC exercises in order to measure which environment could the system work the most efficiently. According to them the main thesis of the TLC's success is that the services provided by the system have to be in accordance with the institute's aimsetting and the term of the instructors' work. Furthermore they point out that beyond the material support, the human resources are vital, and that is why it is important for the administrators to occasionally partake in workshop meetings and work together with the faculty leaders, center principals.

Pchenitchnaia and Cole (2009), Nadler et al (2012) too report that the success is essentially based on the elaboration of programs. They urge consultations, and discussions (which involve the campus as well) about the educational strategies, furthermore the following up of classroom videorecordings, as a tool for monitoring. Besides they deem it important for the istructors to be aware of the students' learning styles. They emphasise the recognition of the connection between the students developmental patterns and diversity, to integrate it into the progress of technological education (Pchenitchnaia & Cole, 2009).

Another researchers' approach were aimed at the efficiency of the TLC, in a context that is adequate for this system. Nadler et al (2012) investigated the effects of TLC in the University of Miami. The main goal of the Top 25 Project was to improve the involvement of students by replanning the courses and to achieve that the interest-oriented learning articulate its effect in the educational materials and in the whole university as well. In favour of pedagogical (collaboration, critical thinking, active learning techniques etc.) and organizational (student satisfaction, reorganization of instructor mentality, application of new technologies etc.) innovations they used several TLC interventions. One of their course, which was reorganized by the TLC system, was the „Inverse class”, where the acquisition of content came to fruition outside of the classroom. Intructors and experts gave the studtens the educational materials before the class by the mean of recorded videomaterials, presentations and studies, then the analysis of these were performed through big projects made by groups on marketing simulations. The outside of the classroom acquisition came to fruition through managmental courses with the further help of the Virtual Leader software. Furthermore they urged the acquisition of collaborational and communicational skills by practical examples in outside of the classroom context too.

Besides the many creative and innovative ideas however we have to revise few problems about the program as well. Firstly we have to be clear about that not every initiative can be measured in numbers, because workshops mostly have personality development effect, which cannot be scaled. Furthermore it is important to know that the efficiency of the TLC cannot be taken for granted, because „it may work or not”. For the institute it may even mean a notable work to create a successfull connection between the center and the classroom

groups. To establish a proper rate of satisfaction for the instructors and students alike, took 3 to 4 years. An example for this is when the reformation of educational materials and the pedagogy of critical thinking development are formed simultaneously, which took several years of correction by taking into account the student assessment and with the help of the TLC's employees. All of these raise awareness about that there are not concrete „receipt” for success, the efficiency demands continuous assessment and innovation (Nadler et al., 2012; Jones et al., 2009).

The European Foundation for Quality Management (EFQM)

The EFQM takes a different approach to excellence than the other two initiatives. The goal of the non-profit organization, which was founded in 1988, to represent the longterm excellence in Europe. The widely used management framework is being used in at least 30 000 organizations in Europe. The model is based on three keystones. The first is the direction, this is followed by the execution and finally the results (recd. from EFQM). The use of EFQM is essentially more widespread in the private sector. This is due to that the public sector is even less able to adapt, which is the result of the customers created pressure. Against that the EFQM model was not designed for higher education (thus to the public sector), however because of its organization developmental effect, its relevance in education is not controversial anymore. Most universities are non-profit organizations, however the main areas of their activities and their established connection with the interested parts are organized based on profit (e.g. their research results and publications financed by sponsorship). The university tend to three main activities, which are the research, the education and the service. The EFQM model is capable of advancing these three areas (Arjomandi, Kestell & Grimshaw 2009; Hides, Davis & Jackson 2004).

The Dutch Quality Institute broadened the EFQM model with five developmental sessions, which fulfill all of the nine criterions. The first session: Activity orientation, during which all activities documented by unique and ad hoc foundations. The second session: Process orientation, which includes the forming of processes and teamwork. This is followed by the third session: System orientation, during which happens the continuous and systematical correction of methods. The fourth session: Chain orientation, which is a sort of external orientation (to the vendors and costumers) that means a merging into the expansive organizational systems. The last period is The fifth session: Total quality management. During this session the organization takes innovative initiatives and compare itself with other organizations (Boele, Burgler & Kuiper, 2008).

The one of the defined substantive points of the EFQM's higher educational goals is the innovations aimed at the executive- and institutional guidance. Calvo-Mora, Leal and Roldán (2006) investigated the efficiency of EFQM in the higher education relation to the institutional guidance. The

assessment in relation to the excellence was made based on the assessment method suggested by the EFQM. The results retrieved from the analysis of the structural model supported the relevance of excellence as a quality indicator. In their study they proved that the development is the most successful when the ranking leaders are committed in the innovation. It turned out that the sufficient directing of people is crucial to progress conduction, which is not solely depend on the people and organizational politics, strategy, instead the proper handling of material and financial resources as well. In the absence of commitment and well-organization the sub-systems of universities are not able to function efficiently and resultfully. As a consequence the plans have to be transplanted into practice properly, furthermore they have to be placed under continuous assessment in order to develop. This is fully supported by the EFQM model, because it is capable of measuring then developing, finally carrying out the development, if the monitoring and documentation are regular and continuous.

Calvo-Mora, Leal and Roldán (2006 p. 116) knowing that the human resource management is a keystone for the efficient quality management, they deemed it important, that the work-force should receive continuous motivation by gratification and recognition. The improvement of human work-force is mentioned with substantive importance in the EFQM model as well. In order to achieve that they mention three essential activities: the correct selection, recognition and career development of employees; ensuring constant further trainings; finally the forming of staff involvement and commitment.

An other aspect of excellence is the skill of creating a proper atmosphere. The EFQM includes several opportunities, which support the development and measurement of self-assessment because the self-assessment is a key factor for the organizational culture to be more supportive, and for the atmosphere to be more friendly. The self-assessment system of the EFQM differs from the traditional point translated assessment, because it does not focus on the developmental areas and weaknesses (Arjomandi, Kestell & Grimshaw 2009). Hides, Davis and Jackson (2004) during their study investigated the United Kingdom's higher educational sector about what kind of effect has the use of the EFQM model on self-assessment. The tools of this project were questionnaires, matrix charts, workshops, pro-formas, and award simulations. During their work they determined five important parts: the training, the data collection, the scoring of workshops, the improvement actions' prioritisation, finally the review of progress. By their result it is necessary to use the assessment of this programs to achieve satisfaction.

The EFQM pays attention specifically to parties interested in the education – for example parents, student and future employers –, besides the precise definition of university goals, in order to achieve satisfaction. All these are as much relevant as the satisfaction of organizational (Arjomandi, Kestell & Grimshaw 2009).

Criticism aimed at the higher educational excellence – Thus teaching or competing exceedingly?

It has become clear with the help of studies and feedback that the higher educational excellence is a complex task. The education has to be assessed, and the students' learning has to be improved at the same time, while the main values of „excellence” have to be protected and reedited. The efficiency of excellence education is not questionable in the literature, however it got criticism several times. The main reason for this that because of the initiatives for excellence the international comparative tables, the market competition and the culture of prestige gain a bigger role which could result in global, commercial and company-purpose universities. Thus the benevolent looking initiatives may seem progressive, however thanks to the higher educational marketable model the interest of the instructors and the students are not in the center of attention. The qualification and at some rate the alumni as well, function as products, so the universities compete by whose „products” are more successful. The consequence of this is that the aim will be the training of elite in exchange for higher charges (Stevenson, Whelan & Burke, 2017; Gourlay & Stevenson, 2017).

Besides we must keep in mind that a term like the excellence is in need for measurement, which makes it available for the higher education to come through an objective sorting of wares. With the help of this the connection between the „clients” and rates of positions opens up. Saunders and Blanco Ramirez (2017) specifically draw attention to the assessment of courses, the measurement of students' satisfaction and the problems about the classification based on these, because the contextual factors do not appear during the global ranking comparison (Gourlay & Stevenson, 2017).

Dixon and Pilkington (2017) touch upon the question of assessment as well, they conceive similarly the subtlety of quantification and note its weakness to manipulation. Furthermore they emphasize that the practice of monitoring could create a tense and stressful atmosphere for the instructors. The competency based models received extraordinary critics, which are provided with scientific severity. Besides they report about the importance of difference in the excellence's definition. Because in some cases the excellence for the instructors were equal to the continuous excellent performance, they tended to ask good opinion and positive assessment from their students to benefit during the inspections (Gourlay & Stevenson, 2017).

Further critics aimed at the systems of excellence in the case of justice mostly in the poor and rich institutes. It is clear that the investments and innovations adjust to the educational frame of the institute, thus those institutes that are able to finance the excellence in a greater manner are far more successful than those that are not able to do so. Besides there are words about that these actions are rather discursive than pedagogical featured (Gourlay & Stevenson, 2017).

However it is important to note that the previously mentioned severe problems occur only in that case when the organization tries to reduce excellence to an indicator kit only. The connection between excellence and marketability could be evidential, however we must not either forget about keeping up the social justice of universities (Gourlay & Stevenson, 2017).

The triumvirate of student, instructor and organization in the higher educational excellence

By the literature review I conclude that, there are three keystones of excellence, which include the student, the instructor and the organization. The results of the chosen initiative depend on which direction the given higher educational institute wants to advance its developments. From the reports of the Student Centered Learning program we can talk about success. The students were able to acquire competencies relevant to a person of the 21st century or to develop already existing ones. The instructors deemed the initiative as a success, because with the reorganized courses they were able to teach and to achieve the goals more efficiently. Based on these we can report that the SCL inhere a student and instructor oriented initiative.

The Teaching and Learning Center program, opposite to the previously mentioned initiative, approaches the theme of excellence not only from a pedagogical perspective, and thus create harmony between the three keystones. Namely it accomplish the excellence with the intentions of organizational development alongside the teaching and learning excellence. That is why we cannot speak about it as just an instructor-student innovation, rather than a complex, comprehensive innovation for the whole institute.

However the European Foundation for Quality Management wants only to develop the institute in a managerial scale, which can be helpful in enhancing the marketability of the 21st century's universities within the nowadays more and more competition oriented higher educational sphere along the restricted financial opportunities as well.

Based on the knowledge of the excellence's programs I could conclude that the student and instructor centered excellence's programs mostly successful in learning-teaching, while the initiative directed to develop leading and educational features, innovate the functioning of the institute. The other end of the triangle is where the organization and students are in the center, and there is a chance for danger, because the instructors could feel themselves monitored moreover they can even have a compulsion for conformity, which could motivate them for a semblance of excellence, rather than for real efficiency. Knowing all these we can say that the excellence is achievable in only that case if the institute aims for real educational and learning excellence, and its organizational structure is nevertheless under constant development.

Figure 1. The areas of excellence in higher education (own editing)

In conclusion we can report that the excellence's programs typically have positively effect on the institutes and develop their educational and organizational structures. However the success is a result of a yearslong progress, which demands continuous monitoring and development. The critical observations have to be present including even the leaders, who mantain critics to themselves as well. Besides there has to be a motivational and dedicated environment, which measure efficiency not only in market scales, but in the level of social satisfaction as well.

References

- Arjomandi, M., Kestell, C. & Grimshaw, P. (2009). An EFQM excellence model for higher education quality assessment, Proceedings of the 20th AAEE Australasian Association for Engineering Education Conference, 1015-1020.
- Baxter, S., & Gray, C. (2001). The application of student-centered learning approaches to clinical education. *International Journal of Language & Communication Disorders: Supplement*, 36, 396-400.
- Boele, E.B., Burgler, H., & Kuiper, H., (2008). Using EFQM in higher education: Ten years of experience with programme auditing at Hanzehogeschool Groningen. *Beitrage zur Hochschulforschung, Heft 1*, 30. Jahrgang. 94-110.
- Brown, G., W. (2011). Student-Centered Learning in Higher Education. *International Journal of Teaching and Learning in Higher Education*, 92-97.
- Brusoni, M., & Damian, R. (2014). *The Concept of Excellence in HigherEducation*. Brussels: Euro-pean Association for Quality Assurance in HigherEducation.
- Calvo-Mora, A., Leal, A., & Roldán, J. L. (2006). Using enablers of the EFQM model to manage institutions of higher education. *Quality Assurance in Education*, 14(2), 99–122.
- Dixon, F., & R. Pilkington. 2017. "Poor Relations? Tensions and Torment: A View of Excellence in Teaching and Learning from the 'Cinderella sector'." *Teaching in Higher Education*, 437-450.

- Frantz, A. C., Beebe, S. A., Horvath, V. S., Canales, J., & Swee, D. E. (2005). The Roles of Teaching and Learning Centers. In S. Chadwick-Bossey & D. R. Robertson (Eds.), *To improve the academy: Vol. 23. Resources for faculty, instructional, and organizational development* (pp. 72-90.) Bolton, MA: Anker.
- Gourlay, L., & Stevenson, J. (2017). Teaching excellence in higher education: critical perspectives, *Teaching in Higher Education*, 22(4), 391-395, DOI: 10.1080/13562517.2017.1304632
- Hides, M. T., Davies, J., & Jackson, S. (2004). Implementation of EFQM excellence model self-assessment in the UK higher education sector – lessons learned from other sectors. *The TQM Magazine*, 16(3), 194–201.
- Jones, S. K., Sagendorf, K. S., Morris, D. B., Stockburger, D., & Patterson, E. T. (2009). Chapter 11: Lessons Learned from Developing a Learning-Focused Classroom Observation Form. *To Improve the Academy*, 27(1), 199–222.
- Kain, D. J. (2003). Teacher-centered versus student-centered: Balancing constraint and theory in the composition classroom. *Pedagogy*, 3(1), 104-108.
- Kemm, R. E., & Dantas, A. M. (2007). Research-led learning in biological science practical activities: Supported by student-centred e-learning. *FASEB Journal*, 21(5), A220.
- Kennedy, R. (2009). The power of in-class debates. *Active Learning in Higher Education*, 10(3), 225-236.
- Kilic, A. (2010). Learner-centered micro teaching in teacher education. *International Journal of Instruction*, 3(1), 77-100.
- Knight, J. K., & Wood, W. B. (2005). Teaching more by lecturing less. *Cell Biology Education* 4(4), 298-310.
- Lu, E. Y., Ma, H., Turner, S., & Huang, W. (2007). Wireless internet and student-centered learning: A partial least-squares model. *Computers & Education*, 49(2), 530-544.
- Unspecifield (2001). Making a European area of lifelong learning a reality. Communication from the Commission. *COM (2001) 678 final, 21 November 2001*.
- Nadler, M. K., Shore, C., Taylor, B. A. P., & Bakker, A. I. (2012). Making waves: Demonstrating a CTL's impact on teaching and learning. *Journal on Centers for Teaching and Learning*, 4, 5-32.
- Novak, G. M. (2011). Just-in-time teaching. *New Directions for Teaching and Learning*, 2011(128), 63–73.
- Pchenitchnaia, L., & Cole, B. R. (2009). Chapter 15: Essential Faculty Development Programs for Teaching and Learning Centers in Research-Extensive Universities. *To Improve the Academy*, 27(1), 287–308.
- Polónyi, I. (2014). Régi, új felsőoktatási expanzió. *Educatio*, 1-21.
- Ruben, B. D. (2007). *Excellence in Higher Education Guide. An integrated Approach to Assessment, Planning, and Improvement in Colleges and Universities*. National Association of College and University Business Officers, Washington D.C.
- Saunders, D., & G. Blanco Ramirez. 2017. “Against ‘Teaching Excellence’: Ideology, Commodification and the Neoliberalisation of Postsecondary Education.” *Teaching in Higher Education*, 391-395.

- Shu-Hui, H. C., & Smith, R. A. (2008). Effectiveness of interaction in a learner-centered paradigm distance education class based on student satisfaction. *Journal of Research on Technology in Education*, 40(4), 407-426.
- Stevenson, J., P. Whelan, & P.-J. Burke. 2017. "Teaching Excellence' in the Context of Frailty." In *Pedagogic Frailty and Resilience in the University*, edited by I. M. Kinchin, and N. E. Winstone, 63–77. Rotterdam: Sense Publications.
- Tärnvik, A. (2007). Revival of the case method: A way to retain student-centered learning in a post-PBL era. *Medical Teacher*, 29(1), 32-36.
- Török, Á. (2006). Az európai felsőoktatás versenyképessége és a lisszaboni célkitűzések. Mennyire hihetünk a nemzetközi egyetemi rangsoroknak? *Közgazdasági Szemle*, *Közgazdasági Szemle Alapítvány*, 310-329.
- Triantafyllakos, G. N., Palaigeorgiou, G. E., & Tsoukalas, I. A. (2008). We!Design: A student-centred participatory methodology for the design of educational applications. *British Journal of Educational Technology*, 39(1), 125-139.
- Tsvetkova, E., & Lomer, S. (2019). Academic excellence as "competitiveness enhancement" in Russian higher education. *International Journal of Comparative Education and Development*. DOI:10.1108/ijced-08-2018-0029
- Tyma, A., W. (2009). Pushing past the walls: Media literacy, the "emancipated" classroom, and a really severe learning curve. *International Journal of Communication*, 3, 891-900.
- Varma-Nelson, P., Hundley, S., & Tarr, T. (2012). The role of centers for teaching and learning in improvement of undergraduate engineering education. Proceedings of the 2012 ASEE Annual Conference & Exposition, San Antonio, TX.
- Weimer, M. (2002). *Learner-centered teaching: Five key changes to practice*. San Francisco, CA: Jossey-Bass.



© 2020 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).