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Research-based learning in higher education: MARIHE case study

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Abstract

Research-based learning (RBL) is a student-centred approach that has become increasingly important in modern society and holds a crucial role in raising independent scientists. The study aims to review the literature around RBL, tendencies and analysis and its transformation from the research-teaching nexus towards more learner-oriented practice. This concept will be interpreted with the case study of the MARIHE program. The data were analysed with a qualitative research methodology – semi-structured in-depth interviews and document analysis. Six graduates and the head of the program were interviewed about their perception, challenges, performance and aim towards MARIHE. Analysis showed that the aim of creating such kind of program was caused by the increased interest and essential changes in the field, also to develop an international outlook with different perspectives towards higher education. For the graduates, this was an experience for strengthening their practical experience with theories and narrowing down the field of interest for further research activities. The curriculum structure includes various types of learning and teaching methods, one of which is RBL. The question to ask was whether MARIHE is an entirely Research-based oriented program or only contains some aspects of RBL that are supported through different formal and informal activities during and after studying the program.

Keywords: research, research-teaching nexus, research-based learning, MARIHE, higher education

Conceptual framework

Introduction

In the 19th century, when Wilhelm von Humboldt started creating a new education model, it was a revolutionary perspective compared to the previous understanding of university, teaching, learning, and research. Humboldt's concept of education does not lend itself solely to individualistic interpretation. It is true that he always recognised the importance of the organisation of individual life and the "development of a wealth of individual

forms" (Gunther, 1988). The core of this model was Humboldts' Neo-Humanist idea of equal availability and academic equity, and it has three main principles:

- Autonomy of Higher Education Institutions (even though the Funding comes from the state);
- Academic Freedom;
- Unity of teaching and research in multidisciplinary universities

He thought that teaching should be led by research and the last one should not be affected by any kind of external influences, such as religion, economics, ideology or politics (Raithel et al., 2007, p. 7). It was to be "a special feature of the higher scientific establishments that they treated science as a problem which is never completely solved and therefore engaged in constant research" (Gunther, 1988). Remarkably, this was the first step and idea of creating research-based universities, which was against the post-revolutionary French concept. In the Humboldtian model, the teacher was free to develop curricula and content and plan activities independently. On the other hand, students have the right to choose their classes. Both teacher and student have their justification for the common pursuit of knowledge. Hence, research and teaching unite (Hattie and Marsh, 1996). Humanistic ideals and free thought should guide the studying process, and knowledge should be formed based on logic, reason, and empiricism rather than authority, tradition, or dogma.

The Humboldtian model drew everybody's attention again in the 1960s' when German Sociologist and Philosopher Jurgen Habermas started spreading these ideas actively.

Despite all these ideas, Hattie and Marsh (1996), in the Relationship between Research and Teaching, A Meta-Analysis - provide some critical ideas towards combining research with teaching: The scarcity Model, The Differential Personality Model, and The Divergent Reward System Model, but at the same time there are two major arguments against those critics. One of them is the Conventional Wisdom Model. Jencks and Riesman (1968) claimed that if the teacher stops doing research, then they "begin to repeat himself and eventually loses touch with both the young and the world around him" (Hattie and Marsh, 1996, p. 511) and as a proof, they bring the work of Neumann (1992). In this

work, Neumann interviewed 33 senior academic administrators. Then he operated on three different levels of the teaching-research nexus: the tangible connection relating to the transmission of advanced knowledge, the intangible connection relating to the development in students of an approach and attitudes towards knowledge and stimulating and rejuvenating milieu for academics, and the global connection relating to the interaction between teaching and research at the departmental as well as the individual level (Hattie & Marsh, 1996, p. 511). Another Argument is the "G" Model – which mainly highlights that the abilities underlying successful teaching and research are similar.

Research-teaching nexus

The versions describing the research-teaching nexus are various. For example, Willcoxson et al. (2011), in their article Enhancing the Research-Teaching Nexus: Building Teaching-Based Research from Research-Based Teaching, bring several theories of the relationship between research and teaching. One of them is Hoddinott and Wuetherick's approach (Willcoxson et al., 2011), which describes the relationship as "a continuum between teacher-focused research-based course content and student-focused research-based process of learning".

On the other hand, in theory, conducted by Healey and Jerkins (2009, p. 7), the classification of research included in the teaching process can be seen in four different ways (Healey, 2010)[1] :

- **Research-led**: where students learn about research findings, the curriculum content is dominated by faculty research interests, and information transmission is the main teaching mode.
- **Research-oriented**: where students learn about research processes, the curriculum emphasises as much the processes by which knowledge is produced as learning knowledge that has been achieved, and faculty try to engender a research ethos through their teaching.
- **Research-based**: where students learn as researchers, the curriculum is largely designed around inquiry-based activities, and the division of roles between teacher

[1] Based on Griffiths‘s (2004) theories, there were only three characteristics of research-teaching that Haley and Jerkins later extended into 4 (2009, p. 7).

and student is minimised.

- **Research tutored**: where students learn in small group discussions with a teacher about research findings.

Table 1: Research Teaching Nexus. Based on Healey (2005)

Student Involvement	Emphasis on Research Content	Emphasis on Research Processes and Problems
Students as Participants	**Research-tutored**: Course content emphasizes students learning in small group discussions with a teacher about research findings.	**Research-based**: Course content emphasizes students learning through inquiry-based, problem-based, and project-based activities.
Students as Audience	**Research-led**: Course content is based on disseminating factual and conceptual knowledge about the research interest(s) of the faculty member.	**Research-oriented**: Course content emphasizes procedural knowledge about the research interest(s) of the faculty member or learning about the process by which knowledge is produced.

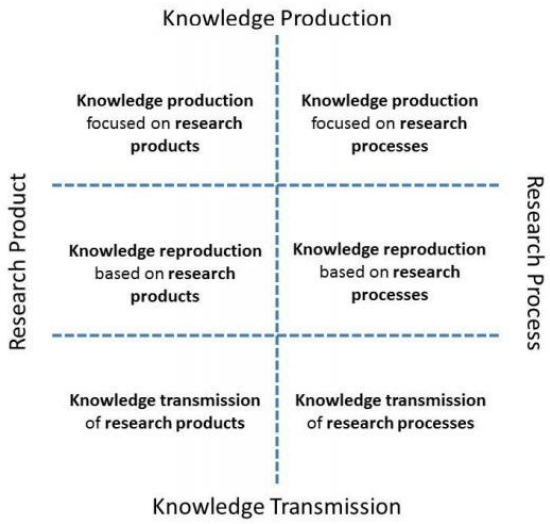
The most valuable outcome of the teaching and learning process is the student's knowledge. In case research is included in the program or module, students become the active elements of this process and not only take, they consume knowledge by themselves together with the rest of the class, teacher, etc., - "Instead of being just recipients of knowledge imparted by the teacher, the students become participants in the process of creating knowledge. They cease to be merely an audience to research: they join their teachers in the activity of advanced learning" (Griffiths, 2004, p. 721).

Transferring teaching to learning

Angela Brew, in the article - Teaching and Research: New relationships and their implications for inquiry-based teaching and learning in higher education (2012), presents the role and importance of learning in this process. Relationships with research and teaching led to the increased importance of motivation for learning and will directly affect better learning performance in research-intensive universities (Brew, 2003; Healey & Jenkins, 2015). She describes the integration of research into learning activities as an added value for students' research perceptions (Visser-Wijnveen, 2009), learning experience (Harland, 2016), and learning effects (Jenkins, Healey, & Zetter, 2007; Pan, Cotton, & Murray, 2013).

Gerda J. Visser-Wijnveen (2012), in the article A knowledge model of the research-teaching nexus, introduces the knowledge transmission model and highlights two primary dimensions of knowledge transmission: knowledge production and research product–research process (Table 2).

Table 2: A knowledge model of the research-teaching nexus. A knowledge model of the research-teaching nexus, based on Gerda J. Visser-Wijnveen (2012)



We can highlight two of these six variants for understanding the research-learning relationship. First, knowledge transmission of research products, based on the Visser-Wijnveen Research products, is used as the start of the learning process about a particular topic. Researchers use artefacts or research results to introduce students to research. Transmission is explicitly not defined as unidirectional but may actively involve students. The second one is knowledge reproduction based on research processes – as learning has a vital role within the research process; the learning process starts with a straightforward question that will be answered in a systematic way (Visser-Wijnveen, 2012).

Wolfgang Deicke, Julia Rueß and Christopher Gess (2014), in the article - 'Increasing Students' Research Interests Through Research-Based Learning at Humboldt-University' describe some defining principles of RBL provided on BAK conference (Baacke et al., 1970):

- To independently choose a research topic and develop a research question;
- To independently determine the research strategy (choice of methods, experimental design, etc.);
- To experience research as a process with the possibility of errors, sidetracks, and unexpected discoveries;
- To work according to the standards of the scientific community;
- To reflect critically on the relationships among hypotheses, methods, and results in their findings;
- Present their results so that they and their significance are transparent to others (Baacke et al., 1970)

In the same paper, there is presented that the RBL is not the only way to scientific performance but argues that all the degree programs should be research-oriented and include characteristics of RBL from the beginning of the academic path. The use of the research-based learning principle holds a key role in this process (Baacke et al., 1970).

Significance of research-based learning

Nowadays, only theoretical knowledge without solid arguments is not considered scientifically valid. Therefore, putting elements of research into the curricula helps develop research skills. In that case, students do not listen only to the existing theories but are also part of the exploring process from the beginning. Curiosity is a clue while studying, so you need examination, analysis, collecting data and different essential elements necessary for research.

"Knowledge and knowledge production (research, teaching, and education) represent crucial features of and for universities and other HEIs" (Campbell, 2013). In Higher Education, teaching and learning can be considered some of the most important parts of this process, and so is research. Researchers of Educational Sciences describe different methods for delivering information to students, and time by time for teachers/professors, it is getting hard to discover which of these methods is sufficient and adequate for transferring knowledge without students getting bored in the class. It should be considered that this is not a one-sided process. Also, for students, sometimes it is linked with difficulties in discovering the best way to learn, especially remembering essential

things during examinations or practice. Sharing the research results with students makes them an audience without being involved in the action.

In the European Commission's document for Supporting Growth and Jobs, an Agenda for the Modernisation of Europe's Higher Education Systems (2011), there is a tendency to increase the number of higher education institutions that are research-oriented and highly ranked. They say: "higher education institutions too often seek to compete in too many areas, while comparatively few have the capacity to excel across the board. Consequently, few European higher education institutions are recognised as world-class in the current research-oriented global university rankings. For instance, only around 200 of Europe's 4 000 higher education institutions are included in the top 500, and only 3 in the top 20, according to the latest Academic Ranking of World Universities" (2011)[2].

This discussion topic is interdisciplinary and connected to different fields in Higher Education. Research is an inseparable element of education. Occasionally, it is getting more challenging to generate new ideas for research, collect all information about your research topic, know all phases, build up the structure, follow the rules and stay competitive. For contemporary education, research became another part of studies, which demands lots of time and energy from students.

Method

This part of the paper provides information about the study's methodological design, which data collection methods were used, how the interviewing process went, what tools were used for data analysis, and which research questions shaped the whole research process on this topic.

Research design

The qualitative research method included a literature review, data collection - semi-structured in-depth interviews with the head of the program of MARIHE and six graduates. The first step was the content analysis – a review of the literature around the topic as a general issue and exploration of documentation – MARIHE curriculum and

[2] European Commission (2011) Supporting Growth and Jobs, an Agenda for the Modernisation of Europe's Higher Education Systems

website, where the learning objectives and outcomes are described, and partner institutions and organisations are represented.

At first, the pilot version of the interview was conducted with one graduate to finalise the questionnaire and start the data collection procedure. The interviews were recorded, as mentioned above, with six students (graduates) of MARIHE. Graduates represented Cohort one, two, three and four. Sampling was convenient and depended on the networking of Alumni. The average time of the process of the interviews was 40 minutes and was done via Skype. The interviews were confidential, without indicating the names of the participants or any related details that can help to determine the identity of respondents. The questionnaire followed the research questions' flow and provided the graduates' perceptions, ideas and experiences towards MARIHE.

In addition, one semi-structured in-depth interview was recorded with the head of the program, which lasted for 40 minutes and aimed to understand better the creation process of MARIHE and other aspects of research questions.

All of the interviews were recorded in November 2019.

Qualitative data analysis software Atlas.ti was used for systemic analysis, arranging and coding the created transcripts based on the recordings. The codes were developed considering the main characteristics of the research questions.

Case study - MARIHE

This paper is built on one case study of Research and Innovation in Higher Education – MARIHE. The program was launched in 2012 and under the Erasmus Master Joint Master Degree framework. The first funding program had five cohorts and, in 2018, got second funding for another six years (marihe.eu). The curriculum of MARIHE, the head of the program and graduates are analysed as an example of RBL. The main objectives of MARIHE are: To educate change agents for systems and institutions of HE, innovation and research; To improve the management of HE and research institutions; To promote internationalisation in HE, innovation and research; To promote entrepreneurship and strengthen university-business relationships; To raise the quality of learning and teaching and make higher education more inclusive (marihe.eu).

Research questions

- How is RBL done in the MARIHE program?
    - What was the process and aim of the creation of the MARIHE program?
    - What are the features in terms of RBL in the MARIHE program?
- What are the experiences of MARIHE graduates while learning in this program?
    - Perception
    - Challenges
- Role of MARIHE in the graduates' future career decision
    - Perception of cohort

Results

How is research-based learning done in the MARIHE program?

MARIHE is a unique program in the Higher Education field with specific learning outcomes. The interview with the head of the program was useful in determining and highlighting the aim at the beginning to start such kind of project in this field. While describing the first steps, he described the reasons and his attitude for creating such type of program:

> I had a dream, as a coordinator, to come up with an international program like MARIHE is, because it was missing in the field of HE research. Also, to create such a global environment with the also highly interdisciplinary program. Because very often, if you come to HE research and development, you are driven by certain disciplinary domains, like psychology, sociology and other co-sciences. And that was the main, I would say - evolutionary initiative, based on our working experiences and screening the field, as we have already worked extensively on professional development programs.

Building up a sustainable program for students from all over the world while being attractive in terms of scholarships and incentives was a challenging task. For implementation, funding has a vital role, and Erasmus Mundus played a key role while forming the program curriculum and structure. To apply for Erasmus+ opportunities, organisations should fill out the specific application form. In addition, it is necessary to indicate and support the program's goals with intended outcomes, priorities, consortium

details, budget, etc. (EAC/A02/2019). Consortium members were chosen depending on the networks of the head of the program and coordinator university, considering their performance in teaching, learning and research activities.

Furthermore, It was essential to include a partner from another part of the world, in this case, Beijing Normal University, to allow students not to be linked only with the European Higher Education system. That was a chance for students to see the diversification of context, culture, and environment and analyse their own higher education systems within distinctive frameworks. The program director explained this process as follows:

> If you apply for Erasmus Mundus, you have to play the game, this also means that some requirements are very strictly defined. You have to translate your reality and goals into the Erasmus Mundus scheme. I think we did it in a good way because we got second funding.

Another big challenge was the organisation of the curriculum and defining teaching and learning activities. When the postgraduate program is about important HE characteristics, such as management, research, administration, and innovation, it is expected to be an excellent provider of this knowledge. This process again was described as an evolutionary by the head of the program:

> With eight or ten professors around the table, we had a difficult academic discussion, and this topic and that topic are significant and very input-oriented. Based on their disciplinary perspective, research agenda and research interests and, of course, the teaching portfolios. And then, quite soon, we stopped this process. This was not necessary. More important at the very end are the skills and competencies.

That caused the organisation of modules in each semester at partner universities. Even though the program has different teaching and learning approaches, the research element is strongly represented. Looking at European Credit Transfer and Accumulation Systems' (ECTS) of the MARIHE 30 ECTS is only for the Master thesis (the exception is the specialisation of learning and teaching at Eotvos Lorand University in Budapest, as their

organisational structure only provides 20 ECTS for the thesis, but will be supported by other course related to research) (MARIHE Curriculum, 2019). That means that at least 25% of the workload is for RBL. Humboldtian Model of the unity of teaching and research (Gunther, 1988) is highly appreciated among MARIHE consortium members. The following quote from the interview with the head of the program illustrates the role of research in MARIHE:

> If you look at the partner organisations, I would say almost each and every professor, not only teachers of the program but also partner organisations, have research capacity and complex work related to higher education research in different fields. So, that is not only a minimum requirement saying that you must do some publishing and research in the field but also a necessity. If you look at the partners' different profiles, they also have diverse expertise and research areas.

The role of research in MARIHE seen by graduates' perspective also supports the view of the program founder:

> For example, in Tampere, all of the things the teachers taught us was something they do research on, as well, so they can give us various up to date research that they could already input in the program.

Students have had to deal with the research process since the very beginning of the studying process. The module – Theories of Higher Education, Research and Innovation is constructed as RBL and requires students to choose the topic related to their studies, dive into the details, conduct research as an independent work and introduce the final paper to the teacher for publishing. In addition, this is not the only course in MARIHE that offers to students doing research and then publishing. With these actions, program creators promote and support students to deepen their knowledge in research. Students will experience this process even before their PhD, so those willing to continue the academic path after graduation already have some fundamental knowledge in this field.

What are the experiences of MARIHE graduates while learning in this program?

One of the leading target groups of higher education is students. In this paper, as it was described in the method part of the research, six graduates from different cohorts of MARIHE were interviewed with semi-structured questionnaires to share their ideas and their experience, RBL, future perspectives, etc. (see Appendix A). It is imperative to know the attuite towards the program before they apply and after they have experienced studying in real. Because of the international outlook, cohort and program lecturers, expectations vary depending on their previous educational and working experience. Some of them wanted to apply theoretical knowledge to their practice. For some, it was a challenge to live far from their country in the international environment and live alone or an opportunity to develop global profiles with research and education. Additionally, MARIHE was one of the leading programs in education science with an attractive Erasmus scholarship. One of the graduates answered:

> Considering my experience in Higher Education, I wanted to go through the management track and get the answers to my questions. But within the program, I suddenly found myself shifting to the research track, and when I had an interview for my PhD position at … I told them - you know, they got me attached to research, never expected that.

Research has one of the critical places in MARIHE, and part of it is research-based learning, as mentioned above. While recording interviews, respondents were first given an understanding of the RBL from the perspective of this research. In the process of discussion, all of them identified some RBL features during their studies. That does not mean that MARIHE is fully build-up on research-based learning principles, but all of them recognised that the program contains some important aspects of RBL. For example:

> One course that I can remember that was almost like that was one of the courses that we had in Beijing, China … The professor had a different approach where we got relatively free topics to choose from and then researched those people or issues generally. Then we draw our own conclusions out of it, and it was in kind of way that there is no wrong answer, more or less ... So that would be one example, and in general, I would say we were left to do our own research, which would fit into the definition for me.

On the other hand, describing features of RBL in the program does not necessarily mean that combining research with learning is easy for students. Students come from different backgrounds in the program. The requirements list to apply for MARIHE does not indicate the specific field of education or even working experience in higher education. Work experience is not an admission requirement. However, work experience can be a substantial advantage for an application, especially if it has been acquired working for (higher) education institutions – MARIHE website, 2019). This especially makes each cohort contrasting. However, most of them have no experience in structuring or handling research.

Here should be highlighted the aspect that makes this program evolutionary. The results showed that the curriculum did not include a module for research methods when the program was first launched. Finally, though, considering students' feedback, coordinators offered this course to guide them to support their better performance.

Most of the graduates mentioned that the first semester in that sense, was the most difficult. One of the graduates mentioned:

> The first semester was actually quite tough because coming from a background where I did not study anything in English. Analysing all these reading materials in English and writing papers myself in a foreign language was a huge turn. But it turned out well, and, of course, it was more challenging for the students who were not from English-speaking backgrounds.

The attitude towards the first semester in Austria was pretty similar among different cohort graduates, and they could also highlight similar approaches from their colleagues from the same year. Therefore, this is another answer to the same question as the previous one:

> I think we all had struggles, especially in Krems, paper after paper, heavy workload, and long days. Also, as I remember, we had one case about plagiarism, and I think research ethics was kind of an issue, also citing correctly. And also, the research structure was not very comfortable for all of them.

As was described above, MARIHE did not ask for specific educational background and for some of the students merging research, learning and other activities that the program includes can be challenging. Especially for those who did not experience research-based education while their previous studies. During the interviews, some respondents mentioned that their undergraduate studies were mostly taught programs, and MARIHE was quite contrasting.

Role of MARIHE in the graduates' future decision

Graduating from Erasmus Mundus Joint Master Degree in Research and Innovation in Higher Education means entering a diverse community of accomplished individuals. Whether you stay in Europe or move to a different country, and regardless of your professional career path, you will always find the support of the MARIHE Alumni community (MARIHE Alumni, retrieved from marihe.eu). Learning outcomes of the program aim to support individuals in continuing their path in the field of Higher Education (any direction) (Learning Outcome MARIHE, retrieved from marihe.eu).
Within five cohorts, MARIHE together has 82 graduates, and this study is one of the practical examples of how strong the connection is. Finding respondents for the research depended on the Alumni's kind will and relationships between them, as the sampling was convenient.

The career opportunities for MARIHE graduates are vast. The consortium aims to be up to date regarding market needs in this field and organises different activities between studying modules, such are employability sessions, How to write a CV and Motivation Letter, presenting in the academic setting, inviting successful researchers in the field to deliver their results, share knowledge and experience. This quote represents the outlook of the head of the program towards job opportunities:

> Education is still one of the fundamental pillars of society … At this very moment, I would say that in terms of job offerings, especially if you are mobile, you are not stuck in one place there are plenty of opportunities, especially for the MARIHE program, as this is a global program. And then, talking about the ministry, quality assurance agencies, global or international organisations, but also universities, institutions, NGOs and then, of course, the field of PhD, which

> is especially if you want to move forward even in a field of administration after a certain position you need a PhD, without that you could not go up.

They aim to create the network not only inside the consortium members but through internship opportunities, where they offer various hosts among the leading organisations of the field (EUA, UNESCO, OECD, CHEPS, etc.). Networking is also part of the MARIHE curriculum, which is vital in future perspectives, especially for those not returning to their countries and jobs.

MARIHE made some students think more about their careers or find their role in Higher Education. Although some of them were not planning to do research and they continued their PhD, some others narrowed down the topics of interest:

> Actually, I was not thinking about PhD when I started my undergraduate degree. I was thinking about it but not really giving it a lot of thought. I really considered myself as a practical person, really in the practical world, and when I graduated from MARIHE, I was not prepared for that. I was thinking a little bit more about it because, in general, research can also be practice-oriented. It does not have to be purely theoretical. It also can have a practical application. Actually, when I graduated, I told myself I would work for a couple of years and then I would see. So, I wanted to go into practice to apply what I have learned in a practical environment. And this is where all these theoretical concepts started making more sense. It was really a good transition from theories to practice.

The results of this research could not be generalised to the whole graduates, as there is no statistical data about their careers. Still, depending on the qualitative data collected from the alumni, MARIHE had some influence on the participants of the interviews.

During the interviews, the graduates evaluated their ideas in general towards their cohort's career performances. From their perspective, a big part of the alumni stayed in the field and continued working in HE. Some participants even expressed that around 20-25% of their cohort is doing PhD or working in a research-related organisation. Furthermore, there is still a considerable part of students who are working in managerial and administrative positions.

Conclusions and implications

Conclusions

Depending on the theories and case study, research-based learning is a complex term containing different principles. It can be defined as gaining knowledge by conducting scientific research which aims to explain, predict and/or control phenomena and is as accurate and reliable as possible (Frankel and Wallen 2009, p. 4).

As the study contained some limitations regarding quantitative data that could not be collected during the research period, the results can not be generalised for all 82 graduates of the program but give the opportunity to draw several conclusions.

The aim of this paper was to review the literature around research-based learning, start understanding the term and its role in the MARIHE through building up a conceptual framework, literature review and collecting qualitative data from the head of the program and graduates. Through analysing the data and connecting it to the theories about RBL, it can be concluded that MARIHE contains some essential aspects of this learning methodology. There were highlighted experiences of graduates when they have experienced RBL in different settings of consortium member universities – In Danube University Krems, Tampere University, Beijing Normal University and the Osnabruck University of Applied sciences. As the rest of the members of the Consortium (Thapar Institute of Engineering and Technology from India and Eotvos Lorand University from Hungary) joined the program in the second round of funding, none of the graduates has experienced the studying process there (marihe.eu). While creating such kind of unique program in the higher education field, it was important to consider the demand of the job market from different levels, such as universities, research organisations, policy-making bodies and other higher education-related institutions.

During the studying process while writing curricula, program creators considered including all the crucial characteristics to support developing the necessary skills and competencies in this field. Furthermore, the students of MARIHE are mobile and are not linked only to one university style and culture. Therefore, the program had to create its unique behaviour and niche with a combination of consortium partners. Research activities are highly appreciated using both research-based teaching and learning.

Students experience being both audience and participants, but considering that 25% of the curriculum is only for Master thesis research, RBL becomes one of the key activities during studying MARIHE. However, students come from different backgrounds, and it is impossible to conduct scientific research without a solid knowledge of how to structure, plan, organise and implement research. During the program, they learn how to transform their ideas into significant research performance. Two modules, "Research Methods" one and two, prepare students for conducting management and social scientific research, applying both quantitative and qualitative methods. These courses will prepare students to do independent research in the field of research, innovation, and HE (MARIHE curriculum, 2019).

Even though, as was discussed in the previous parts of this paper, combining research with learning is not an easy task and requests from students hard work, skills and competencies that are supported by other modules.

Finally, we can conclude that analysing this case study in the framework of research-based learning is successful, and the program contains some aspects of it.

Implications for further research

This research paper was conducted depending on qualitative methods, with the help of a literature review and case study. Even though, to generalise results to the whole program, quantitative data is necessary about the graduates' performance to assess their career opportunities. Therefore, collecting quantitative data regarding this topic is highly recommended.

Besides, research-based learning and teaching is a complex process, and further research will be essential to do a comparative study between the research-based and non-research-based programs to see the real impact of this type of learning.

Studying the research-teaching nexus and understanding its effects of it on the curriculum, skills development, and students' future employability will be the next step for analysing these theories. This research will serve as the basis for creating a practical guide for academic staff to support the transition from a "normal" curriculum or syllabus

to a research-based oriented one, where the involvement of students and teachers will be represented on different levels of activities and engagement.

This research paper served as a pilot study for the paper Research-based Learning and Teaching in Higher Education, Potential for Synergy (Japiashvili, 2021).

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