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THE ROLE OF THE UNIVERSITY OF PRISHTINA IN KNOWLEDGE CREATION AND TRANSFER: ARE UNIVERSITY-INDUSTRY LINKAGES INCREASING?

Abstract

Purpose: This case study aims to analyse the role of the university in knowledge creation and transfer to the industry.

Methodology: Knowledge creation is analysed in terms of research activities, while knowledge transfer focuses on the abilities and motivation of university staff in transferring the science outcome to the industry. The general problems of the lack of data on innovation activities in Kosovo are evident; therefore, this research uses a qualitative research technique. Data were collected based on a qualitative guide interview, combining and analysing 15 semi-structured interviews.

Results: The findings show that part of the achievements is evident, but part of them is questionable in many aspects, e.g., there is a visible asymmetry between knowledge creation and knowledge transfer. By comparison, teaching has improved significantly over the last decade, while critical thinking is not yet at a satisfactory level.

Conclusion: Indeed, much progress and many challenges could be identified over the half-century. The university's efforts are debatable in terms of knowledge creation, and no sign motivates university staff to publish in high-ranking international journals and contribute to research activities. However, the university is continuously improving its collaboration with international donors, e.g., the European Union remains the main partner.

Keywords: University, industry, collaboration, knowledge creation and transfer

1. Introduction

The overall objective of the university case study is to map the factors that shape innovation in the institution of knowledge creation and knowledge transfer, with the focus on the university. Like many other universities in Europe, the University of Prishtina is a traditional university with a leading role in higher education in Kosovo. The University was founded in 1970, based on the law establishing the University of Prishtina, and at that time, it consisted of the

faculties of Law, Economics, Philosophy, Architecture, and Medicine. The campus of the University is located in the centre of Prishtina. The Statute of the University came into force very late, i.e., on 9 July 2004. Presently, the University has 42,006 students and consists of 14 faculties accredited by the Kosovo Accreditation Agency (KAA), along with 900 academic staff members and 300 administrative staff members employed (University of Prishtina, 2019). Not surprisingly enough, all necessary ingredients and all relevant actors of the innovation ecosystem in Kosovo are present. However, a systematic approach toward linking such components to make the innovation ecosystem function properly as an ecosystem that directly supports innovation has been lacking (STIKK, 2014). The Innovation Centre Kosovo (ICK), the Chamber of Commerce, start-ups, companies, universities, and public institutions are the main innovation actors in the Kosovo innovation ecosystem. It is also the largest research centre in Kosovo (Correa et al., 2013).

The paper is structured as follows. Section 2 provides a literature review, Section 3 presents a short methodology, and Section 4 provides an analysis of the University budget composition. Section 5 focuses on the role of the University in knowledge creation and collaboration with the industry, while Section 6 concentrates on the capabilities and willingness of the University to transfer knowledge to the innovation ecosystem. Finally, results and future recommendations are drawn in Section 7.

2. Brief literature review

Innovation is an important source of growth that plays a vital role in determining the competitive advantages of many firms (Lam, 2011) and has been essential for sustained long-term economic development in recent centuries (Baumol, 2002). First, there is a need to differentiate between invention and innovation. While invention means the first idea for a new product or service that universities and academic institutions carry out, innovation is known as implementing ideas that happen at the firm level (Fagerberg, 2003). Schmookler (1966) strongly highlights the importance of patents related to inventive activity. In this relation, it might be worth bringing up the distinctions between narrow and holistic perspectives. While the narrow approach considers the invention (only the first occurrence of the idea), the so-called holistic perspective stresses the importance of understanding the entire cycle of innovation, e.g., from the creation of novel ideas to the commercialisation and diffusion of the idea in practice (Edler & Fagerberg, 2017). Hence, closer cooperation between universities and industry can help match university skills output and labour market needs. Industry inputs could help align curricula to firm and market needs.

Moreover, internship programmes contribute to knowledge creation and transfer. More internships in the industry would allow students to get practical experience and create connections with employers before graduation. Improving the availability of these skills sets among university graduates and the existing SME workforce via on-job training can lead to higher productivity and innovation among SMEs, OECD (2021).

Lundvall and Nelson were the two pioneers in the development of an approach to innovation systems, claiming that it would include, in particular, organisations and institutions interested only in science and research, such as R&D departments, technology institutions, and universities (Lundvall, 1992). Organisations are firms, universities, and policy organisations intentionally designed and with a clear purpose, while institutions are laws, guidelines, and rules, and the leading institutions engaged in innovation systems are patent laws, regulations, and laws governing the interaction between firms and universities (Edquist, 2014). Moreover, in his early work, Edquist (2001) pointed out that firms do not innovate in an isolated environment; thus, the role of institutions is critical for innovation processes as they shape the activities of organisations and the connections between them. Tight cooperation between universities, firms, and public and private research organisations is necessary for significant innovations. Havas (2015) indicated that policy interventions aim to create incentives and increase private R&D, often through subsidies, and protect intellectual property rights.

To sum up, innovation is related to many variables. It needs science, technology, entrepreneurship, critical education, training, finance, and numerous organisations and agencies dealing with intellectual property rights, regulations, laws, and competition. Consequently, most innovations result from new ways of collaboration between firms and diverse organisations and the university, rather than the individual activities of single dominant innovation firms (Nooteboom & Stam, 2008).

3. Methodology and data collection

Arino et al. (2016) claimed that qualitative research focuses on the depth and complexity of new phenomena and highlights the objective of reality by explaining why and how phenomena occur. The general problems of the lack of data on innovation activities in Kosovo are evident; therefore, this research relies on a qualitative research technique instead of a quantitative method, consisting of in-depth interviews with key stakeholders and a review of relevant policy documents. The research tool "case study" method was conducted with the key actors of the Kosovo innovation ecosystem, with a particular focus on university staff. According to Yin (2018), the case study approach is viewed as an empirical method focusing on an in-depth investigation of a contemporary phenomenon within the scope of the real world, mainly when the boundaries between context and phenomenon are not readily visible. In the university case study, knowledge transfer organisations were interviewed to test how innovation emerged, developed, or lacked in Kosovo. Empirical experiences used in this research are based on semi-structured interviews with key innovation-related actors from February 2020 to January 2021. The following case study was carried out at the State University of Prishtina as critical knowledge creation and transfer. The reasoning behind the university case study is to map the factors that shape innovation in the institution of knowledge creation or knowledge development and transfer, such as the University and innovation ecosystem actors in Kosovo. Therefore, the relationship between the University and the industry has been thoroughly studied in this context. The role of the interview for data collection in conducting the case study is essential; in this respect, Malhotra and Dash (2016) suggest some general steps for the conduct of in-depth interviews, and they state that interviews are an unstructured and transparent method of collecting data that are carried out on a "one-on-one" basis. Understanding the importance of the university in the innovation ecosystem, the main objective of this case study is to answer the following research questions: 1) How does the university contribute to the process of knowledge creation through research activities?, and 2) How does the university contribute to knowledge transfer to the actors in the Kosovo innovation ecosystem? Data were gathered using a qualitative guide interview, which combined and analysed 15 semi-structured interviews from university staff, government institutions, the Kosovo Chamber of Commerce (KCC), the industry sector, ICT companies, and an ICT business association. Targeted respondents were informed on time by email, and one-on-one interviews were held as recommended by Malhotra and Dash (2016).

4. University budget composition

Over the years, the University has received only 1.49 percent of the state budget, or EUR 34.79 million in value, with a slight increase in 2020. Table 1 illustrates the University budget allocations between 2018 and 2020.

Table 1 Activity-based budgeting of the University

Year	Wages and salaries	Goods and services	Utilities expenditures	Subsidies and transfers	Capital expenditure	University budget in total
2018	21,158,067	3,052,645	1,175,000	1,299,000	7,150,000	33,834,712
2019	21,263,857	3,402,645	1,175,000	1,444,000	7,500,000	34,785,502
2020	20,986,212	3,422,513	1,175,000	1,444,000	7,900,001	34,927,726

Source: Author's compilation based on the state budget and the Ministry of Finance (2019)

As seen in Table 1, the University has a limited budget, and it has remained at the same level over the years, which determines its low value. According to the analysis of the total university budget of EUR 34.78 million, 88.51 percent is financed from the state budget. In comparison, the University generates 11.49 percent of its own revenue, amounting to EUR 3.99 million in 2019. This means that the University contributed 12.26 percent of its budget, or EUR 4.15 million, from its own sources in 2018. The revenue generated by the University consists of student registration fees or tuition fees and professional services expertise by the institutes and laboratories. The analysis shows that the main budget

of the University is spent on salaries, and the University has not spent its budget correctly for many years now. It is interesting to analyse how the University spent activity-based budgeting. For example, 70 percent of the budget is spent on wages and salaries, followed by 10.43 percent on goods and services, 3.15 percent on utilities, 4.02 percent on subsidies and transfers, and only 12.28 percent on capital expenditure.

Similarly, in 2019, 61.13 percent, or EUR 21,263,857 out of EUR 34.92 million, was spent on wages and salaries. In addition to a small University budget, what can be seen in Table 1 is that there is no money allocated for research activities. The University claims that the strategic plan envisages for the future that 1 percent of the University total budget should be reserved for R&D. However, the study reveals that there is nothing concrete yet. First, to increase the University quality and its higher ranking, the University budget should be managed better, and second, it should increase the number of employees and academic staff.

5. The role of the university in knowledge creation

According to Nielsen (2019), R&D is essential for product innovation, but it is not the only kind of knowledge; sometimes, innovation is linked to the kind of knowledge produced in the sense of R&D, which is also one of the critical functions of universities. Therefore, the case study tries to identify and measure the involvement of academic staff in research activities. The University is aware that knowledge creation remains its most important mission. According to the University Statute, teaching and R&D are two key twin objectives. The Statute obliges academic staff to continuously contribute to research activities using two resources: public funding provided by the University, or private funds sponsored by individual contractors of third parties, or both. Though, according to the case study, this remains questionable.

Moreover, to achieve internationally competitive results, the University teaching staff are also obligated to conduct scientific research and innovate work using their professional skills (Statute, 2005). However, University executives admit that many professors treat the University as a secondary school - students show up in classes and attend lectures, professors teach, and students leave. Indeed, teaching is one pillar and it is essential, but R&D-based teaching, incorporating the results of collaboration with the industry and international partners, should be the most crucial pillar. Unfortunately, presently, this sort of project work is almost absent.

Recently, Webometrics and Times Higher Education (2017), ranked the University 2,829, while the Continental Ranking and the Country Ranking, ranked it 940th and 5th, respectively (Webometrics, 2020), which means that the University is lagging behind in terms of many ranking indicators, especially in the field of R&D (Kaçaniku et al., 2018). However, some analyses of scientific publications undertaken by the Organisation for Improving the Quality of Education (ORCA) and recent updates to the Research Gate indicate some developments in scientific publishing (ORCA, 2018; ResearchGate, 2020). For example, Table 2 indicates an increase in the number of the University publications in 2019 compared to 2017.

Table 2 University scientific publications

Year	Total number of scientific publications
2017	1,320 papers
2018	1,735 papers
2019	2,481 papers

Source: Author's compilation based on ResearchGate and the University of Prishtina (2020)

Table 2 indicates an increase in the number of publications in 2019, but the quality of the University publications is not at a satisfactory level. Thus, the university must continue its efforts to enhance the quality rather than the mere quantity of scientific publications in order to fulfil its mission of knowledge creation. In addition, Table 3 further analyses the total number of scientific papers and the participation of faculties, along with the number of professors involved in publishing.

When analysing the total number of academic staff and faculties, the results indicate that despite a limited number of total scientific publications, the average of publications published by professors by faculties is sometimes even smaller than the total number of professors by faculties. Unfortunately, we have only aggregated statistics on publication activity of University professors, so we do not know the structure of publications according to quality indicators (e.g., the impact factor, Q1, Q2).

Table 3 Number of academic staff involved in scientific publications by faculties in 2018

Faculties	No. of professors	Scientific publications	Number of professors who published	Average
Philosophy	93	35	32	34%
Mathematics	94	524	65	69%
Philology	124	36	39	31%
Law	65	74	42	65%
Economics	89	98	44	49%
Construction and Architecture	65	48	23	35%
Electrical and Computer Engineering	69	57	21	30%
Mechanical Engineering	69	94	29	42%
Medicine	350	528	87	25%
Arts	159	-	-	0%
Agriculture and Veterinary Sciences	79	184	33	42%
Physical Education and Sports	41	14	14	34%
Education	77	94	36	47%
Total	**1,374**	**1,735**	**465**	**34%**

Source: Author's calculation based on ORCA (2018) report and KAS (2019) data

The analysis shows that the University is not performing well in knowledge creation due to a low average of scientific papers published by the University, representing participation of the University with only 34 percent in R&D, which means that the most significant 66 percent of academic staff do not justify the academic title or ranking of the University. Furthermore, there is a lack of criteria since professors should not retain the full academic title if they have not consistently contributed to research activities or have not published a scholarly article in a prestigious journal every year. Even though the University set up the Office of Research and Sponsored Projects in 2017, it aims to facilitate R&D and make it easier for teachers to submit competitive projects and get sponsored. The Office serves as a link between the University academic staff, organisations, agencies, and foundations that sponsor and finance research projects, and operates under direct supervision of the University Vice-Rector for Science. Since it was established, the Office has supported 17 projects in 2018, and 35 other projects in 2019, focused on capacity building. The faculties of Electrical and Computer Engineering, Mechanical Engineering, Philosophy, Economics, Education, and Agriculture are among the main beneficiaries of these projects. Such projects are implemented in collaboration and partnership with several European universities in e.g. Germany, Italy, Spain, Croatia, Slovenia, the United Kingdom, Montenegro, and Albania. As a result, Kosovo's innovation ecosystem was created, and the functions of socio-economic actors are working, but this kind of knowledge requires systematic research into Kosovo's socio-economic and cultural-technological conditions. The University's initiative to establish a venture incubator was a good step that might be spread to other higher educational institutions (Lajqi et al., 2019).

Interviewed University participants acknowledge that teaching has advanced significantly over the last decade, while R&D has improved slightly. The positive shift reflecting generational change of academic staff (e.g., replacing old academic staff with a new generation) has contributed to a positive change in the mindset, as younger professors are more active in research activities. However, research activities are not systematically tracked compared to teaching, which is continuously monitored by the University Academic Development Office through student evaluation of professors engaged in teaching bachelor's and master's degree courses; thus, teaching is performed better as it is

easier to develop and track administration. Moreover, the University needs to improve students' critical thinking. The national qualification framework specifies that critical thinking should be one of core components of the programme and the curriculum, which means that bachelor's degrees should have a critical mindset and it should be compulsory in the master's programme as well. The University admits that students partially gain critical thinking skills.

5.1 University and industry collaboration: important but not focused on building Science, Technology and Innovation (STI) and Doing, Using and Interacting (DUI) relations

The level of education of the workforce is vital for the development and growth (Junge and Skaksen, 2010), and methodological and analytical skills of problem-solving, including absorption capacity and professional knowledge of graduates (STI learning on the university side), are ranked high in terms of the industry's expectations when recruiting graduates (Nielsen, 2019). However, Kosovo's innovation ecosystem actors complain about the lack of good cooperation with the University. Based on the interviews with participants from the metal and wood industries, KCC, 3CIS, Tre Pharm, the ICT sector, and the Association of Information and Communication Technology of Kosovo (STIKK), a classification and elaboration of complaints referring to the University is provided in Table 4, which reflects the lack of University efforts to strengthen cooperation with the industry.

Table 4 Classification and elaboration of complaints by the industry about the University

The case study shows that there is currently the lowest level of satisfaction among firms working with the University. Furthermore, a partnership in terms of STI research has not contributed to innovations since there is no evidence of inventions or patents sold to the industry in Kosovo.	The industry confirms that if the University could provide inventions or patents, companies would be willing to buy and commercialise them. This means that there is a lack of STI and DUI relations between the University and the industry.
The lack of adequate knowledge of the University and the lack of incentives for University personnel are shown as concerns. Kosovo's industry is not satisfied with the students' level of knowledge from the University as the labour force for the industry. Companies claim that students lack soft skills, critical thinking skills, problem-solving skills, and presentation skills.	The industry hires students who are not relevant to their professional background, and this forces companies to invest heavily in offering vocational training, in the field of business interest, along with the practical part of how machines work in a company; therefore, it is expensive for the company to improve the skills of new employees/students.
University curricula and teaching methods are very old-fashioned (the curriculum is updated every three years), not encouraging students to remain up-to-date with their skills. Furthermore, there is a total lack of co-research activities between the University and the industry and a total lack of their commercialisation (a lack of STI & DUI relations).	Although the industry has continuously tried to adjust and adapt curricula to technological developments, the University should be able to provide graduates with up-to-date skills and learning capabilities (e.g., increase the number of students enrolled in science, technology, engineering, and mathematics (STEM) study programmes) in order to exploit significant R&D investments of innovative firms efficiently.
There is a tendency of public institutions and universities to avoid collaboration with the industry. Due to non-systematic cooperation, there is a lack of effort at the University aimed at offering students the industry internship scheme.	While the industry confirms its willingness to accept students for an internship scheme, this is of mutual benefit because it will make it easier for the industry to recruit new workers from an internship programme that demonstrates skills and competencies.

Source: Author's compilation based on the interviews with innovation ecosystem actors

Mutual trust, which is frequently developed in mutual experiences (DUI learning is usually characterised by such collaboration), is necessary for tight collaboration. A study conducted by Nielsen (2019), which rates the University of Aalborg in Denmark as the best in terms of partnership with the industry, argues that innovative firms that have collaborated with universities (building STI and DUI relations) have a much higher probability of product or service innovation (a novelty in product or service

innovation) compared to the segment of firms that have not collaborated with the university. Therefore, a strong partnership between the university and the industry is necessary to achieve successful STI. However, in terms of university-industry cooperation, regardless of the issues listed above, the case study stresses some developments that show some progress in recent years. Nevertheless, the case study tries to figure out how the university contributes to industrial innovation and how this contribution could be improved. The university approves improved ties with the industry resulting from academic staff, but it still needs improvement. The university recognises the importance of industry engagement in a range of issues of mutual interest; thus, it took the first step towards establishing the industrial advisory board. The establishment and principles of the advisory board have enabled the academic units to set up such an advisory board. The main objective of the advisory board is to link the academy with the industry. Through closer ties, the university can prepare graduates with skills better suited to the labour market requirements and work together with the faculty advisory management on updating the curricula.

Furthermore, the main task of the industry is to provide inputs when new curricula are designed. Unfortunately, this has not been done flawlessly because the above complaints have not been addressed accurately. However, some positive changes are evident. The Faculty of Economics has been quite involved in organising the advisory board, addressing economic and entrepreneurship problems, and strengthening job opportunities for students. The Faculty of Agriculture and Veterinary Sciences has also been active in updating academic curricula, improving teaching and learning methods, and providing practical work and innovative conditions (Career Development Centre, 2019).[1] A success story in the field of collaboration between the University and the industry can be illustrated by the industry initiative, where the Kosovo Metal Industry and Renewable Energy Cluster was developed for the first time in 2017, focusing on encouraging the industry and universities to work closely together. The cluster concept was designed to bring development and innovation together and was viewed as a positive start, but unfortunately, this partnership did not last long. The industry confirms that, after cluster formation, the University did not systematically help them and was no longer active. Nevertheless, even with the passive role of the University, the cluster has continued to play an active role, and has consistently offered vocational training to the staff of its member companies, young engineers, students, and jobseekers, and 20 training sessions to 800 participants. Of these 800 trained participants, 70 have completed the internship scheme, and around 100 young people are working in cluster firms.

The Faculty of Electrical and Computer Engineering has made excellent progress through the advisory board concerning the innovation ecosystem development. For example, several computer science students are sent to participate in ICK events because they offer an excellent infrastructure to support students with future challenges. The Faculty highlights various examples as successes, e.g., in cooperation with STIK and ICK, suggestions are considered when preparing new curricula for the new semester. According to advisory board members, up to 20 percent of the industry suggestions have been incorporated into the new curriculum as the new academic year begins. Although the business community is not satisfied with this progress, the curricula are updated every three years, making it difficult for the University to provide graduates with up-to-date skills and raise the number of STEM students. In addition, the advisory board allows students in the final semester of their studies to have a compulsory course as an internship and they are required to work at least 120 working hours on a project in international or domestic companies. This helps students establish industry connections, demonstrate skills, strengthen relations with possible future employers, and improve negotiating positions and regular track records.

For instance, a company from Germany called Wiso Tech GmbH opened a branch and began operating in Kosovo in 2019. The company launched a student scheme and randomly connected university students who started the internship programme, and due to their excellent skills and competencies, the company recruited them and continuously increased the demand for university students. As a result, 12 university students responsible for developing software were engaged in the company between 2019 and 2020. Students are also sent to Germany to participate in the internship programme

1 According to the regulation, the advisory board can have at least 11 members and a maximum of 17 members. Faculties should organise advisory board meetings as needed, but not less than two meetings per year.

at Bosch, Microsoft, and Intel, while some others work in German companies operating in Kosovo, such as Wiso Tech GmbH. In addition, students also participate in internships in domestic companies such as 3CIS, ICK, and STIK, developing software for international and domestic market needs. An intended result of the internship programme is that many students could get full-time jobs, primarily in 3CIS. The analysis shows that 10 percent of students are involved in the internship programme abroad, while 30 percent participate in outsourced activities and work on the local market. Companies in which students engage in the internship programme provide dual training for students on technology development issues.

The idea of bringing business people together to develop student soft skills in technology came from STIKK. However, it is not yet clear whether the University has successfully implemented this activity. The University acknowledges that the industry always complains about knowledge transfer. It is good because as long as the industry complains, the University produces something, but not the best. Thus, the University should educate students who can join various projects and not just particular innovation and technology related projects. There is still a lack of research into the technological, social, and institutional practices at the University in Kosovo that was surveyed. Developing high value-added or strategic collaboration between the University and the industry will significantly boost the University knowledge creation function and help improve the position of the country's firms in the Global Value Chain (GVC). Concerning the performance indicators of University staff, such as the quality of their publications, involvement in international conferences, and the teaching code, the case study shows that the influence of these factors shaping university-industry collaboration is mutually beneficial. Strengthening international and regional cooperation increases collaboration with the industry as the industry is currently at least a step ahead of the University. However, both parties should strengthen the relationship as the advisory board remains only an advisor and not so involved, e.g., both have failed to build STI & DUI relations. As far as STI mode is concerned, there is no evidence in Kosovo of the inventions or patents that have been given to the industry, while regarding DUI mode, only the internship scheme, along with the formation of clusters, can be considered to have led to graduate recruitment. Finally, the University lacks ideas and initiatives to improve cooperation as it tends to change very slowly, but this does not mean that the industry should not push ahead with such efforts.

6. Why lack of knowledge transfer?

Knowledge transfer is a vital part of the role of a university, but offering high-quality lectures requires professors to adapt and develop "state-of-the-art" knowledge. While some progress has been made in creating knowledge, the University is unfortunately well behind in its possibilities of knowledge transfer. Despite the lack of systematic data collection, the findings indicate that knowledge creation and transfer are unbalanced, and the University has admitted this weakness. Likewise, the transfer of knowledge to the industry is relatively weak or even lacking in some fields, and this has been confirmed by the industry; thus, the issue of knowledge transfer needs to be addressed urgently.

On the one hand, the legal framework needs to be strengthened along with the willingness to implement it. On the other hand, knowledge transfer would improve by improving collaboration with the industry and strengthening the role of the advisory board. The University admits that the issue of knowledge transfer has not been adequately addressed to date. However, the study reveals that knowledge transfer is reasonable only in the teaching pillar, which is good, as knowledge creation could be transferred to students. The University needs to increase cooperation with international organisations and donors as one essential tool, while research projects are another driver that should not be neglected. Collaboration with national and regional partners is also essential, both of which are unfortunately not at a satisfactory level. Knowledge transfer needs a time-consuming process of collective learning. Technological developments have rapidly taken place; therefore, university-industry knowledge transfer is a permanent need. Furthermore, the transfer of knowledge from industry to university is necessary, and in this connection, it is worth using the experience of Aalborg University in Denmark as a benchmark (Nielsen, 2019). Due to some improvement in teaching, the transfer of knowledge is working well for students but is not yet in a good phase with the Kosovo innovation ecosystem actors. However, few faculties provide

specific professional services or expertise to public or private enterprises or individuals, e.g., telecommunications, construction, architecture, health, and agriculture, which can be considered a form of knowledge transfer, but it is not satisfactory.

7. Conclusion and recommendations

The findings show that there is asymmetric progress in comparing knowledge creation and knowledge transfer, and the University efforts are questionable in relation to knowledge creation. The University has not yet been able to dedicate financial resources to R&D, and its contribution to R&D accounts for only 34 percent, while 66 percent of academic staff do not justify the academic title. Furthermore, there is a lack of monitoring of professor R&D performance, and there is no sign that motivates university staff to publish in high-ranking international journals. The study recommends that strengthening the role of R&D and increasing knowledge creation in the coming years is necessary to prepare, train, and motivate academic staff to be more competitive in delivering internationally attractive, multidisciplinary, and practice-oriented projects. Likewise, the study recommends that the University should allocate money to R&D and enable academic staff to benefit from that fund and contribute to research activities.

Regarding the criteria for promotion to academic ranks, the University requires academic staff to have five scientific publications to be able to be appointed to the academic title of full professor, but it does not oblige and monitor professors to be active regularly. The research recommends that academic staff should be more active and publish at least one article a year that contributes to research activities. A positive sign is that between 2019 and 2020 the University invested EUR 2.1 million in the development of institutions, laboratories, and infrastructure. An additional EUR 2.4 million is allocated from the University budget to be invested, focusing on increasing knowledge creation and transfer. The study recommends that, while teaching has improved significantly, the University should improve critical thinking for students as this remains challenging because the University does not have any tool to measure student critical thinking. This is confirmed by the industry that complains about the old curricula, which need to be addressed, and the study recommends that the new curricula should be updated and rely on the industry's needs. This often forces companies to employ students unrelated to their professional background and invest heavily in providing vocational training. The study recommends that the University should develop a teaching method to teach high-quality students to think critically and educate students who can take part in various projects.

It is a positive sign that the University recognises the importance of industry engagement in many issues of mutual interest; thus, establishing the advisory board was a good step forward. As a result, many students have been able to participate in the internship scheme, create network industry connections and become fully employed in domestic and foreign technology companies, particularly in the field of international and domestic software development. However, the advisory board remains only an advisor and not so much involved as they have not succeeded in building STI & DUI relations. Knowledge transfer from the University to the industry remains challenging. Hence, what needs to be addressed urgently is creating an appropriate legal framework, enforcing it, and building the ability to enforce the requisite legal framework and the motivation and assessment system for academic staff to be engaged in practice-oriented, high value-added cooperation.

According to scientific results, the fundamental objective of the study has been considerably fulfilled. The findings of the study aim to contribute to the research field and provide an insight into open innovation literature. Of course, since the present study examined only a state university, the findings cannot be generalised to all universities and the Kosovo innovation ecosystem. Therefore, to increase its contribution to the research field, the present study recommends that a similar study should be conducted in Kosovo and the developed countries, and the findings compared with the present study, not using only aggregated statistics measures.

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Appendix

List of persons interviewed in the university case study

Persons interviewed	Date of interview	Position
1 Blerim Rexha	February 2020	Professor and Head of the Computer Engineering Department at the Faculty of Electrical and Computer Engineering at the University of Prishtina
2 Enver Hamiti	March 2020	Dean of the Faculty of Electrical and Computer Engineering at the University of Prishtina
3 Myrvete Badivuku	April 2020	Professor of Economics & Vice-Rector for Budget and Finances
4 Faton Berisha	April 2020	Professor of Mathematics & Vice-Rector for Scientific Research at the University of Prishtina
5 Vjollca Cavolli	May 2020	Executive Director of the Association for Information and Communication Technology
6 Avdi Krasniqi	May 2020	Senior trademark officer in the Intellectual Property Agency in the Ministry of Trade and Industry
7 Laura Zherka	May 2020	Director of the Innovation Department at the Ministry of Education, Science, Technology and Innovation
8 Uranik Begu	May 2020	Chief Executive Officer of the Innovation Centre Kosovo
9 Arieta Pozhegu	June 2020	Executive Director of Kosovo Wood Processing Association
10 Astrit Rexhaj	June 2020	Executive Director of the Metal Industry and Renewable Energy Cluster of Kosovo
11 Fitim Seferi	June 2020	Research Support Officer of the University of Prishtina
12 Yllza Mehmeti	June 2020	Head of the Innovation Division at the Ministry of Education, Science, Technology and Innovation
13 Besnik Loxha	June 2020	Director of the Academic Development Office of the University of Prishtina
14 Berat Rukiqi	January 2021	President of the Kosovo Chamber of Commerce and Assistant Professor at the Faculty of Economics, University of Prishtina
15 Besnik A. Krasniqi	January 2021	Professor at the Faculty of Economics, University of Prishtina