

INTERNATIONAL RELATIONS OF RIGA TECHNICAL UNIVERSITY AND DRESDEN UNIVERSITY OF TECHNOLOGY OVER THREE CENTURIES (1862–2024)

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Summary. The cooperation between Riga Technical University (RTU) and Dresden University of Technology (TUD; Technische Universität Dresden) is one of the oldest international partnerships in the history of both universities. It started more than a century and a half ago and continues today. The cooperation between the two universities has manifested itself in various ways – both by taking over the experience of the university as an institution and sharing it, and in student and lecturer exchange trips. Some engineers and lecturers have worked at the Technical University in Riga, while former residents of Riga have studied and worked in Dresden. Cooperation agreements between the two universities were concluded in the second half of the 20th century. The best students of the renovated Riga Polytechnic Institute (RPI) continued their studies in Dresden and practised in German companies. Both students and teaching staff went to TUD to exchange experiences. The long-term cooperation continues even today, including mutual congratulations on the anniversaries of universities and nominating scientists as Honorary Members of universities.

Keywords: Riga Technical University, Dresden University of Technology, university cooperation.

Introduction

In 1862, when founding a private university with the German language of instruction – Riga Polytechnicum (RP, from 1990 – RTU), the experience of the current German and Swiss technical universities, which were founded much earlier (in Berlin – 1821, in

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Nuremberg – 1823, in Karlsruhe – 1825, in Munich –1827, in Dresden – 1828, in Stuttgart – 1829, in Hanover – 1831, in Zurich – 1855), was used as a model. Although the technical universities in Karlsruhe, Hannover, and Zurich [1] had the greatest influence on the creation of RP, the Technical University in Dresden also occupies an important place in the creation and further development of RP. It, like RTU, changed its name several times (Dresden Polytechnicum (Polytechnische Schule zu Dresden, 1828–1851); Royal Polytechnic School of Dresden (Königlich polytechnische Schule zu Dresden, 1851–1871); Royal Polytechnicum of Saxony in Dresden (Königlich Sächsisches Polytechnikum zu Dresden, 1871–1890); Royal Technical University of Saxony in Dresden (Königlich Sächsische Technische Hochschule Dresden, 1890–1919); Technical University of Dresden (Technische Hochschule Dresden, 1919–1961); Dresden University of Technology (Technische Universität Dresden, from 1961) [2] and is currently one of the 11 universities of excellence in Germany.

The cooperation between Riga and Dresden engineers began even before the start of RP operations. In the 1850s, Julius Ambrosius Huelse (1812–1876), Director of the Royal Polytechnic School of Dresden (1850–1873), played an important role in establishing contacts between the Riga and Dresden universities. He advised the RP Organizing Commission to comprehensively and expertly evaluate the project of the planned educational institution, inviting an experienced administrator and pedagogue, Traugott Samuel Franke (1804–1863) – a German mathematician, Vice-Director of the Hanover Polytechnic School (1849–1863), to familiarize himself with the local conditions, who later became the author of the RP Organization Project (1859) [3]. T. S. Franke arrived in Riga in 1859 and got acquainted with the local conditions in the field of industry and trade, as well as with the influential residents of Riga who participated in the development of the university model. T. S. Franke knew not only the specifics of technical universities but also had a fairly wide circle of acquaintances in Dresden, where he had worked as a pedagogue at the Technical University (1836–1849). He did not have the opportunity to help and see the development of RP because he passed away a year after the establishment of the university. Other personalities entered the life of RP and contributed to its stabilization and growth.

In September and October 1861, representatives of the RP Council visited 19 institutions in 13 cities in Germany and Switzerland to familiarize themselves with the teaching methods and their structure, curricula, study plans, etc., and find a leader for the new university – a director [4]. The Royal Polytechnic School of Dresden was also visited, and after returning to Riga, the RP Council thanked its Director, Julius Ambrosius Huelse, and Professor Johann Bernhard Schneider

(1809–1882) [5]. Starting work and facing the first difficulties already in the first academic year 1862/1863, the review (1863) of Karel Kořistka (1825–1906), Professor of the Technical University in Prague (Czech Republic) on higher technical (polytechnic) education in Germany, Switzerland, France, Belgium, and England [6] was useful to the RP Council. It also mentions the Technical University in Dresden several times [7].

Activities of Foreign Academic Staff at Technical Universities in Dresden and Riga (1863–1919)

Several pedagogues have worked at technical universities in both Dresden and Riga. Several engineers and pedagogues from Dresden are associated with RP. For example, in 1886, Martin Gruebler (1851–1935), who had studied at the Royal Polytechnicum of Saxony in Dresden, started working as a Professor of mechanics and graphostatics at RP [8]. It was his second job (1885–1886) after the Zurich Polytechnicum (1880–1885). The Professor worked in Riga until 1897, when he moved to Berlin. In 1900, M. Gruebler resumed working at his alma mater in Dresden as a professor of technical mechanics, ending his academic activity in 1920.

The second graduate of the aforementioned Polytechnicum in Dresden (1883), Richard Hennig (1861–1922), started working at RP as an Assistant Professor of higher mathematics and theoretical mechanics on 1 January 1891 and continued his work even after its reorganization (1896) in Riga Polytechnic Institute (RPI). From 1896, he held the position of Assistant Professor, and from 1901 to 1914 – the position of Professor. R. Hennig was a German citizen, so he was not allowed to work at the university during World War I. After the war, the Professor continued his work at the Baltic Technical University (1918–1919, the successor of RPI) and the newly founded University of Latvia (UL, until 1923 – Latvian Higher School, 1919–1921). Before moving to Riga, the Professor worked as an Assistant at his alma mater – Royal Polytechnicum of Saxony in Dresden (1887–1890). During his work, he was invited to Dresden by the physicist and chemist August Toepler (1836–1912), who knew his former student [9] and was one of the first RP professors (1864–1868). A. Toepler taught in Dresden for 24 years (1876–1900). R. Hennig continued to develop cooperation and promoted the exchange of pedagogical experience and engineering ideas between Riga and Dresden. The Professor's lectures in Russian were prepared for printing and reproduction by his students who came from the territory

of present-day Poland, RPI graduates Bronisław Michelis (1870–1960) and Władysław Różycki (1869–?) [10].

The salaries of RP pedagogues were not high and competitive, so there was no fierce competition for vacant staff positions. In the first years of the RP's existence, mainly foreigners worked there, most of whom soon found better job offers. RP was lucky to fill a vacancy in 1889 when a lecturer in mineralogy and geology was needed after the sudden death of Assistant Professor Moritz Gottfried (1817–1889) during a botanical excursion. The teaching of this subject was taken over by Karl Bruno Doss (1861–1919), an Assistant in the Mineralogy and Geology Office of the Technical University of Dresden. The professional and scientific career of K. B. Doss was formed at RP / RPI – he started working as an Assistant Professor (1889), then was elected a Professor (1900) [11]. It is known that at the end of the 19th century, he went to Sweden and Switzerland and observed glaciers near Dresden [12]. Today, we know him as one of the most prominent researchers of Baltic geology, especially of the glacial drifts.

For seven years (1863–1870), RP was taught by the Austrian/German mechanical engineering engineer and educator, a graduate of Zurich Polytechnicum (1861) Leonidas Lewicki (1840–1907) [13]. Unlike the pedagogues mentioned above, he first worked in Riga and only then for 33 years (1874–1907) at the Technical University in Dresden. Professor L. Lewicki's career in Riga was just beginning to take shape, reaching its peak after going to Germany, where he became not only a prominent specialist in mechanical engineering but also the Rector of the Royal Technical University of Saxony in Dresden (1903–1904).

RP / RPI Graduates – Pedagogues at the Technical University in Dresden

Only two RP / RPI graduates went to work at the Technical University in Dresden. Antons Baltābols (1860–1925; born in Cēsis), a graduate of the RP Department of Mechanics, worked as an Assistant at the Royal Technical University of Saxony in Dresden (1891–1894). After obtaining an engineering diploma, he worked for a year at RP as an Assistant in mechanism technology (1890–1891). The contacts established in Germany opened up new opportunities in professional work – the young engineer decided not to continue his pedagogical work and got involved in jute production in Austria and Poland. In 1898, A. Baltābols returned to Riga and became the Director of the Linen and Jute Manufactory [14].



Figure 1. Professor Alwill Buchholz (c. 1928).

After World War II, in 1947, Alwill Buchholz (1880–1972), an engineer and the founder of the science of geodesy and photogrammetry in Latvia, started working at the Technical University of Dresden. He started his teaching and scientific career after graduating from the RPI Department of Engineering (1904) and taught both at RPI and UL, headed the UL Institute of Geodesy (1924–1940); in 1920, he was elected a Professor. In 1944, A. Buchholz emigrated to Germany, and in 1947, he was invited to Dresden, a city that experienced heavy bombing in February 1945. After World War II, the infrastructure of the city and the operation of educational institutions had to be restored. Professor A. Buchholz participated in the restoration of the study process of the Technical University – Institute of Geodesy. For the first time in the history of this educational institution, the Department of Photogrammetry was established, the management of which was entrusted to A. Buchholz (1952). The Professor retired in 1960 at the age of 80 but continued to give some lectures in photogrammetry until 1965. He was the initiator of the founding of the Photogrammetry Society of the then-German Democratic Republic (GDR) (1960) and its first leader [15]. The engineer A. Buchholz is still honoured both in Dresden and Riga, in his native Mālupe (on the side of Alūksne) and elsewhere because he is one of the most prominent Latvian scientists of the 20th century, whose works in photogrammetry have gained worldwide recognition [16].

Riga «Polytechnicians'» Studies in Dresden in the Second Half of the 19th Century and the Beginning of the 20th Century

Although studies were fee-based in the second half of the 19th and early 20th centuries, young people from wealthy families often

chose to study abroad. RP / RPI students came not only from the Baltic provinces but also from distant cities of the Russian Empire in the South Caucasus, the Urals, from the territory of present-day Ukraine, Poland, and other places. Often it was more profitable for them to study at one of the technical universities of Western Europe, for example, in Dresden. Some of the students were German or Baltic German, so some families had relatives living in or near Dresden who offered a place to live during their studies or supported them in other ways. The family of Ernst Nauck (1819–1875), the first Director of RP, whose relatives lived in Erfurt, was one of those families. Professor E. Nauck's son, Johannes Wilhelm Nauck (1853–1875), studied at the RP Department of Mechanical Engineering, but due to health problems, he stopped his studies and went to Western Europe for treatment at the same time continuing his studies in Dresden for a short time. His brother Otto Hermann Nauck (1864–1928) also started studying at the RP Department of Mechanical Engineering in 1885 and graduated from it in 1890. His father had already passed away at that time, and his mother lived in Germany, so the material conditions of the family were difficult. Presumably, that is why O. H. Nauck studied in Dresden from 1886 to 1887 – closer to his relatives, who supported the student morally [17; p. 32, 160] and presumably also financially.

Georg Schwartz (1860–1928), born in Łódź (Poland), began studies in Dresden. His studies in Dresden were paid for by Nikolai Turgenev (1816–1879), the brother of the Russian writer Ivan Turgenev (1818–1893), who was married to G. Schwartz's father's sister [18]. In the 1860s, N. Turgenev lived in Dresden with his family for a couple of years and also appreciated the importance of education. G. Schwartz started studying in Riga in January 1880, and five years later, he received an engineering diploma; in 1899, he became a lecturer at RPI and was elected a Professor (1901). In this position, he later – until 1928 – worked at the UL. In the 1870s, previously students in Riga and in Dresden, later RP students Adrian von Ramm (1853–?), Arkadius von Raffalovich (1855–1925) and Baron Viktor Taube (1854–1914) started their studies. Arkadius von Raffalovich and Baron Viktor Taube received the RP agronomist diplomas (1878). All three mentioned students belonged to the family of the German student corporation «Rubonia», founded in Riga [19].

Gdal Tschorny (1867–?), born in Pinsk (Belarus), first studied in Dresden (1893–1894) and then at RPI, obtaining a chemist's diploma in 1898 [20]. The Polish architect Baron Emilian von Lesser (1848–1912) graduated from the Real School in Dresden and then studied architecture in Riga, obtaining a diploma (1881) [16; p. 26]. In 1892, Robert Johann August Erhardt (1874–1941) began his studies in mechanics in Riga, but soon he chose to study in Germany – Dresden,

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Munich, Berlin, and Tübingen, from which he received a doctorate (1897). R. J. A. Erhardt was a well-known Baltic German economist, public worker, and Minister of Finance of the Provisional Government of Latvia (1919–1920) [21]. Jānis Zēbergs (1878–?) began studying architecture and chemistry at RPI, went to Western Europe at the beginning of the 20th century and continued his studies in Germany, receiving a chemist's diploma in Dresden (1908) [17; p. 448]. Later, he was a lecturer at the UL and went on scientific missions to Germany in the summers. Presumably, he also visited Dresden and met with scientists there.



Figure 2. Jānis Zēbergs (c. 1938).

Several dozen «polytechnicians» studied at foreign universities in 1905–1906, when the RPI was temporarily closed as a result of the events of the 1905 Revolution. One of the most popular technical universities chosen by future engineers of RPI was the Royal Technical University of Saxony in Dresden. For example, from November 1905 to November 1906, Armin von Gerkan (1884–1969) studied in Dresden, obtaining an engineering diploma [22]. On his return to Riga, he continued his architectural studies and, in January 1907, received an architect's diploma. After the Latvian War of Independence, he moved to Germany. A. von Gerkan is known in the world as an archaeologist who studied ancient Roman buildings in Italy, Syria, Iraq, Egypt and Greece. Heinrich Pirang (1907–1936), a graduate of the RPI Department of Architecture in 1907, later a well-known architect and architectural historian, and RPI Assistant Professor (1910–1915), also went to study in Dresden (1905–1906). Student and graduate of the Department of Architecture (1912), RPI Assistant (1912–1918), Theodor Burmeister (1885–1920) studied in Dresden (1906) and also went there during the

study year 1911/1912 holidays [23]. Student of the RPI Department of Engineering Kurt Burmeister (1885–?) went to study in Dresden in 1905, got an engineering diploma in 1911, and started working in a large construction firm [17; p. 513]. Together with K. Burmeister in Dresden, in the study year 1905/1906, Estonian Egon Leppik (1883–1960) – RPI graduate (1913) [24], who also obtained a doctorate in engineering in Dresden (1925). Born in Jelgava, Alexander Tenne (1885–?) started his studies in chemistry at RPI in 1906 and continued in Dresden, obtaining an engineer's degree (1911) and a doctor's degree [25]. During the interwar period, he owned a perfume factory in Riga. Paul Boehm (1879–1951), a graduate of the RPI Department of Chemistry (1904), also received his doctorate in engineering in Dresden (1920) [26].

The events of the 1905 Revolution also changed the life of Jelgava-born art historian Friedrich Wachtsmuth (1883–1975). After interrupting his architectural studies at RPI (1902–1905), he continued them in Dresden (1906–1908), obtaining a university diploma. Although the young architect worked in Riga for a couple of years, in 1910, he started working as an Assistant at the Royal Technical University of Saxony in Dresden under the German architect and architectural historian Professor Hugo Hartung (1855–1932) [17; p. 513].

Other RPI students, without waiting for the reopening of their alma mater, studied in Gdańsk, Poland; among them was the later pioneer of rocketry, RPI graduate (1914; with distinction) Friedrich Zander (1887–1933), whose mother was born in Dresden [27].

RP graduate (1893) and RPI lecturer Nikolai Schiemann (1865–1944) went to the laboratories of the Royal Technical University of Saxony in Dresden to gain experience because it was planned to establish a technical laboratory in Riga [28; p. 417].

RPI pedagogues and administration kept abreast of the latest trends in university work, so the experience of others, including curricula, was studied. For example, the Professor of visual geometry, Karl Reinhold Kupffer (1872–1935), visited European universities in the summer of 1905 to familiarize himself with the programs in visual geometry of several technical universities, including Dresden. In September 1905, he wrote a report to the RPI Teaching Committee on the teaching of geometric geometry in technical universities, adding a table showing the number of hours for geometric geometry studies in each of them [29]. Although it was concluded that each university had its own specifics, there was a lot in common in general, and the number of hours in visual geometry was similar.



Figure 3. August Toepler (1860s).

Since 1903, RPI has elected Honorary Members, and in 1906, one of the first RP lecturers (1864–1868), German physicist and chemist A. Toepler, became the second Honorary Member of RPI. He was the first scientist who at Riga Polytechnicum solved fundamental problems that echoed in European science – in 1864, he discovered the so-called «Schlieren photography» (Schlierenmethode) to determine the formation of heterogeneity in clear environments. A. Toepler dedicated this discovery to his colleague, friend and benefactor – Ernst Nauck, the first Director of RP [30].

Not all nominated candidates were elected RP Honorary Members. In 1912, several candidates were nominated as RP Honorary Members, including the former RP Professor from Dresden, Martin Gruebler, who was not elected as RP Honorary Member [31].

By the way, the Royal Technical University of Saxony in Dresden awarded an honorary doctorate degree (1902) to Otto Intze (1843–1904), who was employed as a draftsman in the construction of the Riga–Daugavpils Railway (1860–1862). Later, he became a well-known German civil engineer and a lecturer in water works, building structures, and building materials at the Aachen Technical University and its Rector (1895–1898). The book on iron rolling in construction and shipbuilding, co-authored by O. Intze, was also in the Riga Polytechnicum Library [32].

Cooperation Between the University of Latvia and Technical University of Dresden in the Interwar Period

During the interwar period, the contacts of scientists and lecturers with the Technical University of Dresden did not stop. They continued at the University of Latvia (UL), which included technical faculties. Scientific contacts established by academic staff at the Faculty of Engineering, Mechanics, Architecture and Chemistry were continued by RPI graduates who were familiar with the works and inventions of German engineers and scientists. For example, a German civil engineer, a Professor of strength and building materials, structure statics and steel bridge construction at the Technical University of Dresden, Willy Gehler (1876–1953), whose works were read and quoted [33], as well as his scientific findings were accepted and used in engineering constructions in Latvia. For example, in 1922, during the rebuilding of the Saeima building in Old Riga, the safety and durability of the ceiling of the meeting hall was checked and accepted by RPI graduates, lecturers of the UL – construction manager Eižens Laube (1880–1967), reinforced concrete manager and responsible constructor Persijs Zīlīte (1878–1945), and engineer Eduards Veiss (1886–1966). They referred to W. Gehler, then the Chairman of the German Concrete Society, for his insights and requirements in construction in Germany [34]. In 1922, engineer E. Veiss personally met V. Gehler [35]. At the invitation of the Faculty of Engineering, W. Gehler came to Riga in March 1929 and read six reports. They presented the technical intelligence with questions about the safety of iron structures under the influence of static and dynamic loads; characteristics and applications of high-quality steel structures; the results of the latest tests in riveting and welding of iron structures; on the strength, safety, and fracture hypotheses of concrete and reinforced concrete; for reinforced concrete slabs; production and importance of high-quality cement [36]. The books compiled by the German civil engineer W. Gehler were in Latvian libraries, and they can still be found in RTU Scientific Library.

At the suggestion of the lecturers of the Faculty of Mechanics, in 1929, UL awarded an Honorary Doctor degree to the former Professor of the Technical University of Dresden, the already mentioned former RP / RPI Professor Martin Gruebler.

In 1926, Jānis Asars (1895–1978), Assistant Professor of the UL, went on a business trip to the Institute of Low Voltage of the Technical University of Dresden under Professor Heinrich Barkhausen (1881–1956). J. Asars used the experience he gained when organizing the Low Voltage Laboratory at the UL [28; p. 439]. In order to exchange

experience, lecturers from other faculties also travelled to Dresden, for example, the lecturers of the Faculty of Veterinary Medicine.

Cooperation of the Renewed Riga Polytechnic Institute with the Technical University of Dresden

Cooperation between the two universities continued in the second half of the 20th century when contacts with universities in socialist countries were supported. RPI teaching staff and students went to exchange experience and practice with citizens of Dresden, who in turn travelled to Riga. The number of participants varied, and the group usually included not only students but also teachers. For example, in 1970, there were ten people from DUT, and RPI staff and students organized not only internships in factories but also introduced Riga [37]. In 1975, students of the RPI Faculty of Automation and Computer Technology took care of the well-being of DUT lecturers and students in Riga. Later, in August, the Dean of the Faculty, Pāvels Saveljevs (1924–?), Senior Lecturer Vitauts Klimavičus, graduate student Voldemārs Ozols and seven students – Pāvels Kononovs, Liene Pētersone, Irēna Nagle, Inna Pavlova, Jans Šlihte, Aleksandrs Tarasovs and Viktors Zikins – went to Dresden. An album was created about the trip, which contains information about the practice and photographs [38].



Figure 4. Album «Rīga–Drēzdene. Studentu prakse VDR» (Riga–Dresden. Student practice in GDR), front page (1975).

The goal of the foreign practice for the students was to get to know industrial companies in other countries corresponding to their speciality, to work in the laboratories of related universities, to see the industrial complexes of these countries, and to learn the most advanced methods and the latest technology. The best students, loyal to the Soviet

government, went to practice. The selection of students took place, and a positive description was required, which was issued by the faculties and departments (chairs) who knew the students and confirmed that they were worthy of representing RPI abroad. The Soviet authorities ensured that one of the main goals of cooperation with foreign countries was realized – the communist and international education of teachers and students [39]. Future specialists from RPI Faculties of Chemistry/Chemical Technology, Architecture and Construction, Engineering, and Power Engineering also went for practice at DUT.

The RPI Department of Internships was involved in the organization of internships abroad, and almost all study specialities had internships in one of the socialist countries, including the GDR [4]. For example, in the 1970s–1980s, students of the Faculty of Apparatus Construction and Automation (FACA) specializing in precision mechanics apparatus, semiconductors, and electro-vacuum mechanical engineering went to DUT and its laboratories for practice [41]. From 1977, FACA textile industry machinery and apparatus and light industry machinery and apparatus speciality students went to DUT for practice [42]. During the internship, RPI students got acquainted with the production processes in large GDR factories – printing machine company «Planeta», typewriter factory «Optima», etc. [43].

In the following years, cooperation expanded, and cooperation agreements provided for various forms of cooperation. In the 1970s, the scientific cooperation of the two universities flourished, providing for the internship of scientists and students. For example, RPI Professor Alberts Skudra (1925–2003) conducted research on polymer materials together with colleagues and researchers from Dresden [39]. The Department of Heat Supply, Gas Supply and Ventilation also had scientific cooperation with DUT. In 1989, Viktors Mironovs, a Professor at the Faculty of Architecture and Civil Engineering, did an internship at DUT.

DUT's experience in teaching was introduced at various conferences and through the press. Unlike at RPI, DUT's students did not have lectures every day, but only two days a week, studying independently on the other days. German students also learned mathematics differently – they were taught not only the material of this subject, but they also widely used the materials of special subjects, bringing mathematical thinking closer to specific specialties. Alfrēds Vācietis (1913–2009), RPI Vice-Rector for Science at the time (1962–1974), considered the usefulness and use of such an approach in Riga as well because learning mathematics at the university was difficult for many [44].

The Council of Mutual Economic Assistance (COMECON – economic organization of Soviet-bloc countries to facilitate international economic cooperation of the communist countries of eastern Europe, 1949–1991)

played a significant role within the framework under which student exchanges took place during the development of diploma projects. For example, in the academic year 1985/1986, DUT students Mario Schulz and Michael Kastner were among the diploma students in the Department of Production Process Mechanization and Automation of RPI FACA. RPI provided both students with qualified scientific guidance, consultations, and methodological and practical assistance. M. Kastner's diploma project was supervised by the Head of the Department Pēteris Sliede (1941–2005), M. Schulz's diploma project was supervised by Senior Lecturer Imants Kauliņš (1930–1989). The topic of the diploma projects was equipment for product packaging. M. Schulz had to develop a project for a bottle supply unit for a high-productivity beverage filling line, M. Kastner's work was related to caramel packaging machines. Both students had previously been in practice at RPI and visited several companies in Riga [45].

The Department of Production Process Mechanization and Automation, which also trained design engineers, and the DUT Department of Processing Machines concluded a long-term cooperation agreement on the topic «Tehnoloģisko mašīnu un automātu automātiskās projektēšanas sistēmas izstrādāšana» (Development of the Automated Design System of Technological Machines and Automata). Their research was led by RPI Assistant Professor P. Sliede and DUT Professor Joachim Hennig [46].

After the second year, the best and most active RPI students had the opportunity to study at universities in socialist countries, including the GDR. For example, in the study year 1970/1971, DUT had three students from Latvia, students of former RPI Faculty of Chemistry and FACA: Juris Jansons continued his studies at the Faculty of Chemistry, Ieva Grīviņa – at the Faculty of Information Technology [47]. On 29 December 1971, J. Jansons, together with another former student of the RPI Faculty of Chemistry, Visvaldis Dirnēns, met with former classmates, lecturers, and other interested parties on the premises of RPI to talk about the experience and requirements for studying at DTU [48]. J. Jansons specialized in the synthesis and use of colours in Dresden; after his studies he returned to Riga and worked as an assistant at his alma mater during the academic year 1973/1974 [49]. In the academic year 1971/1972, six former «polytechnicians» studied at DUT. A student of the RPI Faculty of Civil Engineering (1976–1978), Juris Marnauza continued his studies at the DUT Faculty of Hydrotechnical Construction (1978–1981). The work of J. Marnauzs, a graduate engineer and hydrotechnician, was related to port structures, piers and bed deepening issues. He was a Construction Manager in the Baltic Sea Hydrotechnical Construction Trust and a Designer in the Department

of Bridges; later he was the Deputy Manager of the Port of Riga in engineering matters [50]. Arvīds Rubīns, a student of the Faculty of Civil Engineering, went to Dresden in the late 1970s and, after graduating from the university, participated in the construction of roads in the gas and oil fields of Western Siberia [51]. The number of specialities and faculties at DUT, where our students continued their studies, was constantly increasing. For example, the second-year students of thermal energy specialities of the RPI Faculty of Electroenergetics continued their studies at universities in the GDR – Freiburg and Dresden – starting in 1982. For example, Juris Kronenbergs, who had studied industrial thermal energy for two years at RPI, studied at DUT in the academic year 1983/1984 [52]. In order to study at DUT and other universities in the GDR, a good knowledge of the German language was required. This is well described by the experience of Antra Andrejeva, a student of the mentioned faculty. Antra had to learn German because she had only studied English in secondary school. During half a year, the student learned the German language as part of the secondary school program in Moscow (at that time, trips were monitored and controlled from the capital of the USSR, accepting or rejecting RPI's decisions on sending students abroad). Antra passed the German language exam in Moscow, then in the summer of 1985, she improved her knowledge of a foreign language for two months in Leipzig, and already in the fall, she started studying energy engineering in Dresden. She studied for three years and had an internship at a design institute near Dresden, and in 1988 she received a DUT diploma [53]. In 1985, Marts Švēde graduated from the Faculty of Architecture of DUT, connected his life with RPI / RTU and is currently a Lecturer at the Institute of Architecture and Design.

One of the forms of cooperation was lecturers' internships and guest lectures. Some examples. During the academic year 1973/1974, Georgijs Boldirevs (1938–2017), a Lecturer at the RPI Faculty of Civil Engineering, did an internship at DUT, getting acquainted with the latest literature and learning modern construction technology and building in complicated weather conditions [54]. In 1984, RPI Professor Andris Krēsliņš, a heat, gas supply, and ventilation engineer, was a visiting professor at DUT. Professor Egons Lavendelis (1934–2023) also gave guest lectures at DUT.

RPI and DUT library employees also visited their colleagues, and as customary in the institutions of the USSR, friendship ties between the youth communist organizations of the two universities were strengthened [55]. Most of the RPI students were members of the mass Komsomol organization and were involved in the reception of DUT guests. The history of the university, emphasizing the revolutionary

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traditions of the RPI, was presented to the guests by the staff of the RPI History Museum [56].



Figure 5. The gratitude of the student internship group of the Technical University of Dresden to the staff of the RPI History Museum for introducing the history of RPI (30.07.1985).

RPI, which was called not only the forge of engineers but also the most athletic university in Latvia, was devoted to sports activities with students from other universities and participation in competitions. For example, in May 1967, RPI men's volleyball and handball teams went to a competition in Dresden. RPI students won the matches against DUT students and Dresden city teams. The students of Dresden University came to Riga on a return visit, and on 15–16 June, friendly volleyball and handball competitions were held between RPI and DUT students [57].

RPI basketball players were also known to Dresden students, who, in the 1970s, had made special friends with the athletes of DUT and the Prague Higher Technical School. At that time, a student of the RPI Faculty of Civil Engineering and later a graduate (1971), the Captain of the RPI Men's Basketball Team had many friends in Dresden and Prague. Also, RPI FACA Assistant and later RPI / RTU Professor Edgars Balcers did not lack friends in both mentioned cities; and this friendship also contributed to his pedagogical and scientific activities [58].



Figure 6. RPI Rector Egons Lavendelis opens the International Student Competition «Draudzība-88» (Friendship-88) (1988).



Figure 7. The RPI Team at the opening parade of the International Student Competition «Draudzība-88» (Friendship-88) at the Daugava Stadium in Riga (1988).

The international student sports competition did not take place for many years for various reasons and resumed in 1988 when the international student competition «Draudzība-88» (Friendship-88) was held in Riga. Their initiator was RPI / RTU Rector (1985–1999) Egon Lavendelis [59]. Students competed in basketball, volleyball, handball, and athletics. Such a large-scale competition with the twinning universities of socialist countries was held for the first time, and guests – students from DUT, as well as other technical universities of the GDR, Poland, Czechoslovakia, and Bulgaria, took part in them. Although it was intended that such an international competition become a tradition, it did not continue. As the political situation in the world changed, with the collapse of the socialist system, both the GDR and the USSR and other countries ceased to exist.

Riga Technical University Cooperation with Dresden University of Technology

The long-standing cooperation between the two universities continues even today. In 1990, after changing the name of the university (later the name of the oldest technical university in the Baltic States – Riga Technical University) and obtaining full autonomy of the university,

it was concluded that the Central European system of higher technical education would be the most suitable for the university. RTU and the universities of neighbouring countries had freed themselves from the USSR university model. Starting the search for new educational content, a micro-conference on the Central European higher technical education system was organized from 19 to 23 November 1990. It was attended by representatives of universities from several countries, including DUT Professor Bertold Knauer (1935–2017) [60].

The agreements concluded during the Soviet era were no longer valid after the university's name was changed and Latvian statehood was restored; therefore, in 1993, RTU concluded an international cooperation agreement with DUT [61]. Within the framework of the European Union's education program, training, youth and sports support in Europe, «Erasmus+» contracts were concluded in engineering, transport and environmental science.

Internships and guest lectures of lecturers from both universities, RTU and DUT, also continued. For example, an electromechanical engineer and RTU lecturer, Jevgenijs Barkānovs, was an intern at DUT (2000, 2003) and gave lectures to DUT doctoral students (2002, 2008). In 1993, the Faculty of Textile and Clothing Technology created an International Habilitation Council for the light engineering and textile industry sub-sector, «RTU H-11», which included foreigners, including DUT professor Hartmut Rödel.

On 23 November 2012, a lecture «Kompozītmateriālu konstrukcijas ar integrētu svārstību kontroli un integrētas bojājumu diagnostikas funkcijas» (Composite constructions with integrated oscillation control and integrated damage diagnostic functions) by DUT guest lecturers was held at the RTU Faculty of Civil Engineering [62].

Several summer schools have been organized in which RTU and DUT, as well as representatives of technical universities of other countries, participated. For example, such a summer school was organized from 18 to 29 July 2022 in Riga [63]. It was organized and financed with the support of the Association of Top International Managers in Engineering (T.I.M.E., TOP International Managers in Engineering). It includes 56 engineering educational institutions (universities) from 24 countries, including DUT and RTU. The T.I.M.E. coordinator in RTU is RTU Vice-Rector for Academic Affairs (from 2023), Professor Elīna Sarkane-Gaile.

It should also be mentioned that RTU and DUT scientists worked on the project SUCCESS (Solutions for Unified Communication Competences for Engineering Students and Specialists) from 1 November 2021 to 1 November 2024, organizing, for example, three summer schools in 2024 [64].

In 2024, cooperation between the two technical universities also began in the research on personal protection and sports clothing. The RTU Laboratory of Personal Protective Equipment is involved in it, which is the only testing and evaluation laboratory of a wide range of personal protective equipment, textile materials and textile products in Latvia [65].

Not only universities are involved in various projects but also scientific institutions where scientists and graduates of these universities work. For example, in 2018, RTU scientists signed an agreement on project implementation with Leibniz-Institut für Polymerforschung Dresden [66]. In October 1995, the Goethe Institute in Riga and DUT, with the financial support of the Free State of Saxony, in cooperation with Latvian colleagues, held a seminar on the issues of rehabilitation of cities, block and panel buildings and restoration of historical buildings [67]. RPI / RTU graduates participated in it. Also, on 26 April 1997 in Ventspils, DUT Professor Rudolf Morgenstern's report «Tradīcijām bagātās būvniecības substances nodrošināšana un saglabāšana jaunās būvniecības vidē» (Ensuring and preserving the traditional building substance in the new construction environment) was intended for engineers – architects and urban planners educated by RPI / RTU [68]. In Latvia in 2007, DUT Professor Wolfram Jäger gave a lecture on the basic principles of designing masonry structures in the European Union. RTU lecturers also learned about regulations and practices in the European Union from the following guest lectures [69].

Greetings from the People of Dresden to the People of Riga on the Anniversaries of the Universities

The long-term cooperation has not only promoted friendly and collegial inter-university relations but has also made us get to know their history and remember their anniversaries. One of the biggest anniversaries was in 1912 when the then RPI celebrated its 50th anniversary. Eleven German technical universities from Aachen, Berlin, Braunschweig, Breslau, Danzig, Darmstadt, Dresden, Hannover, Karlsruhe, Munich and Stuttgart sent a joint Congratulation Letter to people of Riga. Although the congratulation was written on behalf of the rectors of all mentioned universities, in reality, the Congratulation Letter had only one signature of the Rector of the Hannover Technical University (1911–1913) Karl Mohrmann (1857–1927) [70]. He was also an RP lecturer (1887–1892)



Figure 8. Fragment of the Congratulation Letter of the Technical University of Dresden on the 125th anniversary of RPI (1987).

In 1987, RPI received a Congratulation Letter with the symbol of DUT on its 125th anniversary. It mentioned the exchange of students and lecturers, as well as the guest lectures of the then RPI Rector E. Lavendelis in Dresden. The Congratulation Letter was signed by DUT Rector (1986–1990) Hans-Jürgen Jacobs (1936–2019) and the first District Secretary of the German Socialist Unity Party (Sozialistische Einheitspartei Deutschlands) Rudi Vogt [71]. Also, on the following anniversaries, the people of Dresden sent congratulations and wished success to RTU and its students, lecturers, and scientists. Unfortunately, the congratulation letters have not been preserved for the future because RTU rectors received congratulations electronically – in e-mails, which were lost when changing work computers and when rectors changed.

Conclusions

The cooperation between Riga and Dresden engineers began even before the establishment of RP and continues to this day. Its aim is the exchange of engineering ideas and scientific knowledge, as well as visits of students and lecturers to partner universities, the exchange of experience, and participation in joint projects. DUT has entered the TOP 500 world universities. RTU's goal is to join the people of Dresden in this ranking in the coming years. Both universities have long traditions and a rich history – DUT is one of the oldest technical universities in Germany, and RTU is the oldest technical university in the Baltics. Both will continue their joint cooperation in the future. RPI / RTU, along with other Latvian higher education institutions, the Latvian University of Life Sciences and Technologies and UL, which have cooperated with DUT – one of the largest technical universities with long traditions in Saxony, has gained significant experience from its foreign partner university over many years.

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SOURCES OF ILLUSTRATIONS

Figure 1. Latvijas Universitāte ilustrācijas. Rīga: [Gulbis], 1929, 18. lpp.

Figure 2. Jāņa Zēberga ārzemju pase, 1938. g. LNA LVVA 3234. f., 24. apr., 17896. l., 2. lp.

Figure 3. RTU Vēstures muzejs.

Figure 4. RTU Vēstures muzejs.

Figure 5. RTU Vēstures muzeja viesu grāmata.

Figure 6. RTU Vēstures muzejs.

Figure 7. RTU Vēstures muzejs.

Figure 8. RTU Vēstures muzejs.



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Rīgas Tehniskās universitātes un Drēzdenes Tehniskās universitātes starptautiskā partnerība trijos gadsimtos (1862–2024)

Rīgas Tehniskās universitātes (RTU) un Drēzdenes Tehniskās universitātes (DTU) sadarbība ir viena no senākajām starptautiskajām partnerībām abu augstskolu vēsturē. Tā sākās pirms vairāk nekā pusotra gadsimta un turpinās joprojām. Abu augstskolu sadarbība izpaudusies dažādos veidos – gan pārņemot augstskolas kā institūcijas pieredzi un daloties tajā, gan studentu un docētāju apmaiņas braucienos. Daži inženieri un docētāji ir strādājuši tehniskajā augstskolā Rīgā, savukārt Drēzdenē ir studējuši un strādājuši kādreizējie rīdzinieki. 20. gadsimta otrajā pusē tika noslēgti abu augstskolu sadarbības līgumi. Atjaunotā Rīgas Politehniskā institūta (RPI) labākie studenti studijas turpināja Drēzdenē, praktizējās vācu uzņēmumos. Pieredzes apmaiņā uz DTU devās gan studenti, gan mācītāji. Ilggadējā sadarbība turpinās arī mūsdienās, neaizmirstot savstarpējos apsveikumus augstskolu jubilejās un nominējot zinātniekus par augstskolu Goda biedriem.

Atslēgvārdi: Rīgas Tehniskā universitāte, Drēzdenes Tehniskā universitāte, starpaugstskolu sadarbība.