

BRNO UNIVERSITY OF TECHNOLOGY (BUT)

FOLLOW-UP EVALUATION REPORT

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1. Introduction

This report is the result of a follow-up evaluation of Brno University of Technology. European University Association's (EUA) Institutional Evaluation Programme (IEP) previously evaluated Brno University of Technology in spring 2018, with a report submitted to the University in June 2018. In March 2022 the University subsequently requested that IEP carry out a follow-up evaluation.

1.1 Institutional Evaluation Programme

The Institutional Evaluation Programme (IEP) is an independent membership service of the European University Association (EUA) that offers evaluations to support participating institutions in the continuing development of their strategic management and internal quality culture. IEP is a full member of the European Association for Quality Assurance in Higher Education (ENQA) and is listed in the European Quality Assurance Register for Higher Education (EQAR).

The distinctive features of IEP are:

- a strong emphasis on the self-evaluation phase;
- a European and international perspective;
- a peer-review approach; and
- support for improvement.

The focus of IEP is the institution as a whole and not the individual study programmes or units. It focuses on:

- decision-making processes and institutional structures and effectiveness of strategic management; and
- relevance of internal quality processes and the degree to which their outcomes are used in decision-making and strategic management, as well as perceived gaps in these internal mechanisms.

All aspects of the evaluation are guided by four key questions, which are based on a "fitness for (and of) purpose" approach:

- What is the institution trying to do?
- How is the institution trying to do it?
- How does the institution know it works?
- How does the institution change in order to improve?

1.2 Brno University of Technology's profile

The history of Brno University of Technology (BUT) dates back to 1899, when it was established as the Czech University of Technology, the first Czech higher education institution in Moravia and the second

in the country at the time. After a short period as a military academy in the 1950s, the scientific and engineering faculties were then re-established as a civil institution, and further extended over a period of some years. From 1989, new faculties were established and since 1990 the institution has consolidated over three main areas of the city. BUT offers scientific and expert knowledge at eight faculties and three university institutes, covering a broad range of technical, economical and artistic fields as well as fields of natural sciences. Whilst maintaining its position as one of three major general technical universities in the Czech Republic, BUT has diverse faculties (Faculty of Civil Engineering, Faculty of Mechanical Engineering, Faculty of Electrical Engineering and Communication, Faculty of Architecture, Faculty of Chemistry, Faculty of Business and Management, Faculty of Fine Arts, Faculty of Information Technology). The university estate underwent an extensive programme of construction and renovation in the years 2010-2016.

As of October 30 2022, BUT had 18,643 students (including Erasmus students), of which 12,030 were undergraduates, with 4,976 enrolled on Master's programmes and 1,637 on doctoral programmes. The demographic decline in 18-20 year olds entering higher education in the Czech Republic continues to affect BUT, although institutions may admit up to 10% fewer than its maximum number without their funding being reduced.

Policy and funding regulations for higher education institutions in the Czech Republic are determined by the Ministry of Education, Youth and Sports, and for science and research by the Research, Development and Innovation Council. In terms of internal governance, structures and details are prescribed in the requirements of the Higher Education Act. Academic faculties have a strong tradition of devolved autonomy within institutions.

The central budget from the Ministry of Education, Youth and Sports is distributed to each faculty according to their contribution based on student numbers. Faculties are autonomous in the management of their own allocated budgets, within the national law and the internal regulations of the University as approved by Senate. Other sources of income are research grant funding; and a smaller portion of income generated by other faculty activities, including commercial contracts and international students.

An amendment to the national Higher Education Act in 2016 established new rules for the organisation of higher education institutions, and introduced a new system of institutional accreditation, quality assurance and assessment. The institutional accreditation process, under the responsibility of the National Accreditation Bureau for Higher Education, represents a significant change in the approach to accreditation of study programmes. Under the new system, an accredited institution may prepare and approve its own study programmes in specified subject areas, using its own approved internal processes, without having to describe each one specifically to gain separate approval at national level. The award of institutional accreditation requires a demonstration of appropriate staffing; engagement with industry to develop relevant programmes; and quality assurance mechanisms for teaching, research and financial management. In 2018, BUT successfully gained institutional accreditation, under which the university was granted the right to approve its own study programmes in several subject areas.

A further recent development is that BUT is now a member of the Association of Research Universities in the Czech Republic, one of only six institutions to hold this status.

In January 2022, a newly elected Rector and his appointed management team of vice-rectors took up their positions at BUT. As part of his election campaign, the Rector had published a comprehensive programme outlining his vision, values and proposed steps to lead to the 'excellence, prosperity and competitiveness' of BUT, in the context of the external and internal challenges facing higher education and technical universities.

1.3 The evaluation process

The self-evaluation process was coordinated by a central group, chaired by the head of Development and Analysis, and including vice-rectors, the Chancellor, the Bursar, the chair of the Student Chamber, with representatives of the central administration, and of the deans. A small group initially prepared a framework responding to the recommendations of the last evaluation, then consulted all levels of management, including the faculties, and student representatives to Senate. Comments were then incorporated into the report. The content of the self-evaluation report was agreed between the Rector and the faculty deans, and the final version circulated within the university.

The self-evaluation report of BUT, together with the appendices, was sent to the evaluation team in September 2022. The team found the report to be comprehensive, with helpful comments and updates on the present situation for each recommendation.

Further to this, an online preparatory meeting was held between the evaluation team and the self-evaluation group, including the Rector, on 20 September 2022.

Additional documentation requested by the evaluation team was supplied in October 2022. The full set of documentation considered by the team comprised:

1. Self-evaluation report
2. SWOT analysis 2022
3. The rector's proposed programme when standing for election
4. BUT Quality Assurance and Internal Evaluation Report – in full, written and approved during 2018
5. BUT Quality Assurance and Internal Evaluation Report – up-date for 2021
6. Final report - Development of the System for Internal Quality Assurance and Evaluation
7. Institutional performance indicators of BUT
8. Institutional indicators BUT faculties / institutes
9. BUT research indicators
10. Strategic Plan of BUT 2021+
11. Implementation Plan of the Strategic Plan of BUT for 2022.

The visit of the evaluation team to BUT took place from 7 to 10 November 2022.

The evaluation team (hereinafter named the team) consisted of:

- Prof. Jānis Vētra, former Rector, Rīga Stradiņš University, Latvia, team chair
- Prof. Pierpaolo Limone, Rector, University of Foggia, Italy
- Irina Duma, PhD student, Technical University of Cluj-Napoca, Romania
- Prof. Karen Willis, Professor Emerita and former Dean of Academic Quality and Enhancement, University of Chester, UK, team coordinator

The team thanks the Rector, Prof. Dr Ladislav Janíček, senior managers, faculty deans and vice-deans, and the self-evaluation group for their warm hospitality and for the open discussions. The team would like particularly to thank Hana Doležalová, as the liaison person who, together with her colleagues, efficiently prepared and organised all arrangements and meetings for the visits. Thanks are also extended to all staff and student representatives, and external stakeholders whom the team met during their visit, for their open and full engagement in meetings.

2. Governance and institutional decision-making

This and the following sections will follow up on the findings and recommendations from the initial evaluation as well as examine any new issues that have emerged in the meantime. In the 2018 report, a number of recommendations were raised, each of which is separately numbered in the sections below, with the team's follow-up observations.

1. *The team recommends that the university initiate a review of all support processes to clarify the balance of both responsibility and enactment at faculty and central levels, respectively, and to minimise duplication*

The team found that, since taking up his position in January 2022, the new Rector has taken clear steps towards implementing his wide-ranging election agenda. This has included a reorganisation of the Rector's office, to take forward a clearly-articulated approach to the balance of responsibility between central services and the faculties. The team heard that this is underpinned by four main principles: (i) coordination, common standards and consistency of approach between central and faculty management; (ii) defining methodologies for what should be done centrally, and what at faculty level, with respect to the principle of faculty subsidiarity; (iii) the analytical role of the Rector's office, in providing evidence-based support for faculty decision-making; and (iv) protection and support of the university and its staff in the wider environment of, for example, legal and regulatory matters.

The university structure has otherwise remained stable since 2018, with no major changes to faculties or institutes. The national legislation for universities defines the role of faculties and the scope of their autonomy and authority. The team found that central services understand the Rector's emphasis on their primary role as providing support to the faculties. For example, one aspect of the role of the Office of Studies is to advise faculties on how to be successful in the accreditation of new study programmes. The Finance or Budgetary Department supports other departments of the Rectorate in preparing internal rules for the faculties, and provides regulatory advice to faculties in making their financial decisions, as required. This is supported by the determination of quality performance indicators. There has also been a strengthening of central marketing activities, with the restructuring of the Marketing and External Relations Department, and a review of centrally organised international activities, including plans for recruiting more international students.

A further example of how the balance of responsibility has been clarified is in the location of the knowledge transfer office in the Rector's office, under a new post of vice-rector, accompanied by the relocation to faculties of some staff as coordinators in this area, thereby strengthening the link to faculties. The overall intention is to reduce bureaucracy, for example by delegating the sign-off of project applications from the Rectorate to the faculties. The team heard that several of the larger faculties had established their own offices to support their dean and academics in preparing project proposals, but that the central project management team could provide guidance where required; by contrast, smaller faculties with less resource for administrative infrastructure consequently relied more on the expertise of the central office in preparing project submissions.

In the area of human resources, faculties are by law autonomous and responsible for their own staffing matters, including salaries. However, a recent update has given the Rector some influence over decisions on appointments of professors, associate professors and those responsible for study programmes. The central Human Resources office offers support by providing guidance, organising workshops and responding to requests for advice, particularly when staffing issues might have arisen.

The team heard of the Rector's plans to extend more strategic activity to the faculties, by providing the opportunity for them to bid into funds provided by the Ministry for development of the university. Faculties will be asked how they plan to use this money to reflect some aspect of the strategic priorities of the university, as set out in the Rector's programme.

The team formed a clear impression of the shared vision and purpose in the senior management and strengthened communication with faculties. The team found that that BUT was achieving greater clarity in defining the balance of responsibilities between central departments and devolved faculties, and in setting up appropriate structures and processes to facilitate their enactment.

2. *The team recommends that the university establish more consistency of data between faculties and the central level, and the use of a shared, comprehensive tool or information system, for transparent evidence-based decision-making*

BUT has undertaken a review of its information management and support systems, including a focus on the accuracy and reliability of its data, in order to inform more evidence-based decision-making. The SER reports (p3) on work underway to develop the institution's own integrated management information system, drawing on separate basic databases, to enable advance analytical work including the combination of data from different areas, such as finance, human resources, research and teaching. The system requires some compulsory inputs of information from faculties, together with some central information from the Ministry of Education. The senior management of BUT emphasised the importance of data in the management of all aspects of its activities: teaching and learning, research, quality, rankings.

At the time of the 2018 evaluation, different information systems had been in use for a variety of purposes in faculties; although most of the main systems were connected, two faculties used their own, from which information was then transferred centrally. The institution planned then to simplify these systems and centralise information consistently. The team were told that that BUT's work on reviewing the quality and different types of its information systems was still in progress. The team heard of plans to upgrade the finance system and to invest in a project support system in order to collect more integrated data on projects. The intention was for information systems on student records to have been unified by the end of 2022.

The team found that substantial progress had been made in the BUT's approach to strengthening its information systems, and thereby its data management and use. This improvement in the institution's analytical capacity has been taken forward by the establishment in August 2022 of a new central specialist department of Development and Analysis, which leads institutionally and supports faculties on data analysis, quality and strategy.

Deans affirmed to the team that there was a significant change in strategic thinking and planning since 2018, with strong leadership from the Rector's office in the use of indicators and data in decision-making processes. This approach was relatively new and in the process of being cascaded to deans and their faculties, who welcomed the clarity in strategic planning as a whole university. This was supported by improved communication between the Rector's team and the deans, including an increase in regular face-to-face meetings, and also through the introduction of appropriate software tools for online communication and document-sharing.

The team recommends that **BUT continue the positive work in progressing towards full implementation of consistent use of information systems and data in decision-making.**

- 3. The team recommends that the university consider how structures might be used to facilitate more interdisciplinarity in research and education to meet the current needs of the technological sector and of society*

The SER (p5) outlines the emphasis placed by BUT on supporting interdisciplinary research, highlighting the multidisciplinary nature of the activities undertaken by the CEITEC research centre, together with the network of other organisations included in this centre, and the opportunities this creates for integration of the fields of life sciences, advanced materials, nanotechnology and cybernetics.

The team heard of a number of examples of interdisciplinary working within and between faculties. The SER notes that 'the interdisciplinary approach is often applied in the design and implementation of research projects carried out in cooperation with industrial partners'. Annexes to the SER provide a list of 22 recent projects submitted by BUT in response to a call from the Technology Agency of the Czech Republic, and also a list of 13 interfaculty/institute research projects approved for university support in 2022 which involved collaborations between doctoral students from various faculties and institutes of BUT.

- 4. The team recommends that the university consider that planning for longer than five years may be necessary in order to tackle some of the structural and legal constraints*

In response to this recommendation, in 2019 the university formulated its Strategic Intent 2030, which has shaped subsequent strategic planning at BUT. This was created under the university's own initiative, since the Ministry only requires the institutional strategic plan to extend for five years. Additionally, BUT is required to respond to the Ministry of Education, Youth and Sports' long-term Strategic Intent for higher education for the period from 2021 (SU MEYS 2021+). Under a statutory regulation, the institution has to publish an annual statement of strategic intent to align with that produced by the Ministry.

The SER (p6) reports that BUT therefore created its Strategic Intent 2021+ to reflect both its own 2030 Strategy and also the priority objectives of the Ministry's Strategic Intent 2021+. This is an extensive and detailed document, setting out priority and operational objectives, indicators of success and planned measures. After approval by the relevant university bodies, including Senate, the BUT Strategic Intent 2021+ then formed the basis of strategic plans of the faculties and institutes, reflecting both their own and the university's strategic objectives. The team was told that BUT expected to need to keep this plan under review in the shorter term, due to the challenges of the internal and external environment.

3. Quality culture

1. *The team recommends that BUT consider how institutional accreditation might be used to reduce bureaucracy through synergies*

In 2018, BUT was successful in gaining institutional accreditation, under which it was granted the powers to accredit its own programmes of study in several major subject areas: Architecture and Urbanism, Economics, Electrical Engineering, Energy, Chemistry, Computer Science, Construction, Civil Engineering, Technology and Materials, and Art. Institutional accreditation was granted for 10 years, and applies to Bachelor's, Master's and doctoral levels of awards in all these subject areas. Prior to this, all BUT's study programmes were accredited by the Czech National Accreditation Bureau, which continues to approve provision in those subject areas not currently included in the scope of BUT's institutional accreditation.

In order to manage its new responsibilities, the university has established its own processes for those programme areas which it has authority to accredit, reflecting those undertaken by the Bureau. This includes establishing its own methodology for both approving and reviewing programmes every five years, including an internal Evaluation Board to quality assure proposals for programme design and delivery, and also making use of external subject evaluators in these procedures.

The team heard that these developments were not only procedural but involved a substantial change of mindset for the institution. This was because of the new level of internal responsibility that accompanied ownership of the procedures for quality assurance of programmes, which in the accredited subjects no longer depended on the judgements of an external body to approve, or reject, programme design proposals put forward by faculties, but was determined by the authority of people within the university.

The team heard that one challenge in this process could be ensuring that programmes in subjects which are delivered in more than one faculty (for example, Architecture which is taught in both the Faculty of Architecture and the Faculty of Civil Engineering), are consistent and of comparable quality, although each might have its own distinct emphasis. Institutional accreditation has not to date affected the overall number of study programmes offered at BUT, although the university has stated its aim to reduce these in line with European trends (SER p7).

The team was told that institutional accreditation had not to date reduced the amount of bureaucracy involved, although the team heard no complaints about bureaucracy from those they met. The team was informed that BUT had been very aware of the potential risks to reputation and its accredited status should it be found not to be discharging its new responsibilities diligently and consistently, and had therefore been mindful to ensure that the processes established and conducted under its new powers were both thorough and robust. However, the team heard that, as the institution gains confidence and maturity in exercising its own authority, it would be in a position to review and possibly decrease bureaucracy, while in accordance with the law, as its own systems and enactment of responsibilities become embedded in the quality culture of the institution.

The team was also interested in how BUT might be able to use institutional accreditation as a tool for responsive, flexible development of the university in future. The team therefore recommends that **BUT explore opportunities for increasing flexibility in adapting and updating programmes in response to feedback within their approved 5 year period.**

2. *The team recommends that the university re-evaluate the appropriacy of the ISO methodology as a tool to establish common understanding of academic quality culture*

The SER explains (p8) that some faculties still use the ISO methodology, notably for internal audit of some support processes, or where required by an external contracting agency. Overall, the university participates in a range of wider quality associations, for example the European Foundation for Management Development, and frameworks such as the Bologna Process and the European Standards and Guidelines.

The central view was that the introduction of new systems and strategies, arising both from institutional accreditation and from the introduction of internal use of data analytics and indicators, was bringing an improvement in thinking about quality in a more holistic way.

3. The team recommends that BUT work towards ownership by staff and students of evaluation processes in order to build quality culture

With the award of institutional accreditation status, BUT has gained specific responsibilities for ensuring the internal evaluation of the quality of its academic provision. These include the preparation of an annual evaluation report of each programme by its study guarantor; an annual evaluation of selected study programmes by BUT's Internal Evaluation Council, using other academic staff; student feedback on the teaching and resources of individual courses; and preparation of the institutional BUT Quality Assurance and Internal Evaluation Report and its annexes. which is received by Senate. Faculties also complete annual quality reports, which are received by their respective faculty boards.

However, the team heard general agreement that institutional accreditation had not yet changed the quality culture at all levels within the institution, and that this would take time to embed. The team was informed that the Department of Development and Analysis was working to promote wider thinking about quality within the university, supported by the provision of a comprehensive range of benchmarked data and performance indicators to inform quality evaluation. Outcomes to be considered in promoting an institutional quality culture related not only to the teaching process but to the entire scope of higher education, including, for example, graduate employment and research publications. The team recommends that BUT **continue to consider possibilities to promote informal and formal ways of improving consistent quality culture at all levels of the university community.**

4. The team recommends that BUT undertake more consistent collection, and make better use of, evidence to support quality evaluation and enhancement

The team found that data collection, and the provision of data analytics to faculties to inform their decision-making, was significantly improved since 2018. This is leading to a more evidence-based approach to quality evaluation and enhancement. Faculties are now able to use consistent, up to date data, for example about graduate employment, to inform the modification and development of their programmes, implementing a Plan, Do, Check, Act approach. Relevant data is considered in annual quality reports, and also in the processes for approval and periodic review of study programmes. The team concluded that BUT has made great progress in developing effective processes to collect and analyse information about study programmes and other activities to feed into the internal quality assurance system, in accordance with the European Standards and Guidelines (ESG).

The team heard that the Rector's methodology for distributing the budget will take into account some quality parameters, reflecting those employed in international rankings, for example the ratio of teachers to students on each study programme. Additionally, these budgetary mechanisms are intended to promote more cooperative working between faculties and departments, for example to reduce duplication in subjects such as mathematics. It is intended that the strengthened use of reliable and consistent data in measuring faculty performance will enable more transparent comparability and stimulate academic performance and quality. It was well-understood by Deans that the adjustments

to budgeting rules are designed to provide greater support and recognition to excellence in research and teaching than in the past, with a view to improving the quality rankings of the university.

The team found that the university had made excellent progress since 2018 in its use of consistent, reliable data to inform its quality assurance processes.

5. *The team recommends that the university ensure follow-up from all quality processes to provide feedback on their outcomes to involved members of BUT, both staff and students*

Students are invited at the end of each semester to complete online surveys of their views on the quality of teaching, resources and other aspects of the courses they have undertaken. Each teacher receives their own evaluations, and the head of department sees those of all their teachers. Every year the head, who also receives a report on each study programme written by its programme leader/guarantor, then evaluates each teacher. Any critical responses from students should be discussed and could result in an individual plan if the teacher needed to improve, although the team was told that this was not always a strict process. Feedback also feeds into the faculty self-evaluation reports received by faculty Academic Senate which includes student representatives who may then comment.

However, the team heard that the completion rate of student surveys is still very low, at around 20%, and that they are not always meeting their intended outcomes. Students whom the team met expressed the view that the low response rate might partly be because survey was too long, and not completed until several weeks after the end of the course. They suggested that more students might engage with the surveys if they were shorter and focused on the main points of the subject content and teaching, with quicker feedback provided in response to their comments. However, some appreciated having this mechanism to express their views, especially if they had found the teaching unsatisfactory, and understood that this could benefit other students in future. Mostly, those whom the team met thought that students tended not to complete the questionnaires because they perceived their views did not change anything. One course representative reported that she had explained to students on her course how important it was to give their feedback, and that this had been effective in promoting a higher completion rate of that survey.

Students whom the team met had differing views on whether their comments were listened to and acted upon by faculty managers. Some reported that, although there was a tradition of students in their faculty meeting with the management, their points were often rejected and did not influence decision-making. Others thought otherwise, and felt that they did have some active involvement in decisions, reporting that some teachers took recommendations into consideration to improve their teaching methods, and that one head had made a staff change where comments about poor teaching had persisted. Generally, student satisfaction with responses to their feedback appeared to depend largely on the extent to which individual deans and heads of department were found to be student-centred and open in their approach.

Students reported that they highly value direct exchanges of feedback between teachers and students, researchers and supervisors. Effective cooperation happened more easily small faculties, but not exclusively. The team heard of an example of students in a large faculty who felt that they had strong connections with their faculty managers and were able to exercise some influence. In one example of 'closing the loop' by reporting back to students on their feedback, the faculty dean holds open meetings with students to share comments and department responses publicly, and to provide students with an opportunity for further discussion. One student explained how he then shared these responses more widely with other students through a blog. This faculty had invested in trying to

improve communication with students, and the team was told that the response rate to their surveys seemed to be improving.

The most effective approach to engaging students appeared to be through conversation and regular faculty management meetings with students, who can then communicate any need for urgent change. This was thought to complement and support the survey mechanism, and the example was given of credit points for a subject being changed after many comments on questionnaires. Students greatly appreciated the opportunity to talk to staff, and found that changes were more likely to be made as a result of interviews than questionnaires. They acknowledged that, at programme level, conversations with staff were far easier with smaller groups than with classes of several hundred students.

Although the low response rate to student surveys remains an issue, the team heard some instances good practice in promoting communication and feedback to students on the outcomes from quality processes, and recommends that **BUT explore mechanisms to share good practices in using student surveys.**

6. The team recommends that BUT make full use of the strong SWOT analysis by taking appropriate follow-up actions

As part of the supporting documentation for this follow-up evaluation, BUT provided a comprehensive SWOT analysis for each area of the IEP self-evaluation report. As with the SWOT analysis produced at the previous evaluation, the team was impressed with the organisation and detail of this document, which articulates an open and insightful summary of strengths, weaknesses, opportunities and threats for each category. Although the status of this document and the intention for its use were not clear to the team, they considered that it provides a potentially useful framework for communication, discussion and review of the university's position at all levels of the organisation.

4. Teaching and learning

1. *The team recommends that BUT strengthen research-based teaching, particularly at Masters level, to widen horizons of graduates*

The SER states that ‘research-based teaching is a condition for accreditation of Masters degree programmes’ (2017 directive), and that this is achieved primarily through the compulsory thesis (or artistic activity in arts disciplines). Master’s programmes are mostly project-based, and students are encouraged to work in small groups to foster independent learning and to use their knowledge to find solutions to real-case problems, sometimes as part of a cooperation with industry. Students gave examples of being involved in projects from the first year of their Masters programmes. The team heard evidence of research being embedded in degree programmes and of adequate resources.

The SER also highlights that BUT has received funding (EUR 4 million) towards the design of four study programmes with a strong element of interdisciplinarity, with interconnected research and teaching activities.

2. *The team recommends that BUT establish consistent training of new academic teachers, and CPD for existing teachers, on how to teach with an explicit student-centred approach*

On their visits to faculties, the team met committed and highly motivated teachers. They explained that, during the pandemic, the university had offered some support in organising online teaching, and that studies had been maintained. Academic staff had found some aspects of engineering less straightforward to teach online, and the team was told that both students and staff preferred full face-to-face teaching to a blended learning model. However, others reported that the online environment created in response to the pandemic was still used, and useful.

Courses for new teachers are offered at faculty level, and also centrally through the Lifelong Learning Institute. The team heard that it is difficult contractually for academics to go back into industry for updating, and that there was not a strong tradition of this in the Czech Republic.

It is evident that training and continuing professional development (CPD) opportunities exist for teachers, with courses offered to teaching staff to improve their skills, which are considered particularly useful for new colleagues, including PhD students who teach. However, these are not mandatory, and the team found no evidence of systematic engagement. Operational objectives of the strategic plan include developing initial and continuing education for academic staff on teaching methods, through the university’s Lifelong Learning Institute. In the team’s view, the organisation of professional development should be more structured and the team recommends that **BUT invest in the systematic promotion of pedagogical training and continuous development for all academic staff.**

3. *The team recommends that the institution consider appropriate means in a competitive environment to attract applicants with the potential to develop*

The SER (p19) reports active steps being taken by BUT to extend its marketing and increase promotion of technical education in schools, including working with the South Moravian Region on an agreement to strengthen the teaching of mathematics, physics and chemistry. Faculties provided strong evidence of the marketing and outreach of BUT engineering studies with secondary schools to attract a wider pool of students.

It is important that, once enrolled, students from schools with less background in technology, maths and science should be well-supported in order to be able to achieve in their academic studies. The

team heard from students in one faculty that success in the first year of Bachelor's studies could be influenced by which high school they had attended. Many found that the maths and chemistry required for their programmes were very difficult, and as a result dropped out. The team heard from the managers of this faculty that as many a third leave in the first year.

Students felt that because lecture groups were often very large, it was hard for some teachers to support students who might be struggling. They mentioned a step-by-step book that had been developed by a former PhD student which they had found to be very helpful, and the team suggests that such resources and other interventions are particularly important for retaining students who have potential to develop but who might have been recruited from schools with a less extensive foundation in maths or chemistry than some others.

- 4. The team recommends that BUT encourage students with disabilities to apply for study at BUT through better information to prospective students, and ensure systematic support is widely and equitably available to current students*

The team heard little new information on this area. Students whom the team met affirmed that they were aware of the university's Alfons Centre, which provides support to students with particular needs, and some had seen a video promoting awareness of the service. The SER (p19) refers to the provision of sign language interpretation and the recent success of a deaf graduate from BUT.

New observations

The team observed examples of very high quality facilities and infrastructure at BUT, and noted the challenge in the current environment of high energy and maintenance costs.

In terms of flexibility of students' programmes, the team heard that in some faculties students may choose to undertake an elective course, but that this option was not often taken up due to lack of time for additional studies. There was some support in the faculties for students having the option of studying any additional course within the university, but it was explained to the team that work would be needed to develop appropriate financial and other mechanisms, such as timetabling, before this could be adopted. Additionally, the team was told that BUT needs to agree a consistent understanding of how credit values of courses are determined, and that this is a wider issue in the Czech Republic.

There were already flexible pathways within some study programmes, to enable students to focus on specific areas of interest within their subject. The team was told of some examples of student-centred pedagogical approaches and programmes being prepared across different faculties. In one example, students from a small programme recounted that they were able to be flexible and had 'co-created' their studies by establishing a company, thereby gaining a real connection with the labour market. The team heard of one example of an interdisciplinary study programme being developed between departments in different faculties, and potentially involving a social science department at another local university.

It was noted by faculty staff that the current structures of their accredited study programmes would have to be changed for electives to be systematically incorporated, and that this could present particular difficulties for technical programmes which require professional and regulatory body accreditation. The team understood the challenges in providing opportunities for interdisciplinarity and flexibility in technical programmes, particularly at Bachelors level, but in the context of the increasing importance in higher education of student-centred learning, flexibility and interdisciplinarity, recommends that BUT **investigate possibilities for interdisciplinarity and elective courses at all study levels.**

5. Research

1. *The team recommends that BUT foster interdisciplinary research projects through appropriate opportunities and incentives to reward both top-down and bottom-up approaches*

The SER (p12) explains that most research project proposals are prepared at faculty or institute level, in response to calls from national and international funding providers, with advice and support on submissions and project implementation offered by BUT's Project Support Department. This central unit also coordinates proposals for interfaculty projects and leads on the development of strategic research projects. Examples were given of applications currently being prepared for four large-scale projects aimed at supporting applied research, and involving planned cooperations with other leading Czech universities.

The SER (p33) lists 13 interfaculty research projects approved for support in 2022, and a table (p34) shows that in 2021 15% of BUT articles registered in the Web of Science database involving collaboration between more than one faculty or institute. These overviews provide good examples of different collaborations and added value within the university. Faculty researchers told the team that they undertook activities with companies, and that they were now focused on gaining European, as well as national, research funding. There was an ambition for more international collaboration, for example on projects focused on environmental strategy according to the Green Deal. Some project calls state that there must be cooperation between different disciplines, and one proposal recently submitted was based on cooperation between four countries. The team noted the great potential for development of interdisciplinary projects and recommends that BUT **explore more widely the potential for interdisciplinarity in research.**

2. *The team recommends that BUT investigate the possibilities to improve funding for doctoral candidates in order to strengthen their links to the university*

There is basic stipend for doctoral students, which faculties and institutes have discretion to amend from their own budgets. The team learned from Master's and PhD students whom they met that students were often able to apply for small grants, and that additional funding generally depended upon whether the student was working on a specific project that had attracted a grant. The team was told by students that personal research for a Master's thesis can be quite financially demanding, particularly in subjects that are practice-oriented and require expenditure on materials.

The SER (p14) outlines the results from a 2020 survey conducted by BUT, which show that additional funding from grants or projects was a significant factor in the successful graduation of doctoral students. In response to this outcome, a number of measures were suggested in possible mitigation and shared across the university's faculties and institutes.

The team was told that a national reform to doctoral studies is anticipated, which will provide an increased level of basic support for all doctoral students. In the context of an expected national reform of doctoral studies, the university is considering the areas of competitive expertise in which it may establish full doctoral schools in identified areas of excellence.

3. *The team recommends that BUT assist researchers in fuller use of systematic support in the preparation of applications and in technology transfer*

Researchers explained that the larger faculties provide good support for staff in preparing their proposals for funding applications, and that support was also available from the Rectorate's Project Support Department, if needed. Sessions on applying for funding were provided centrally by the

university and also by national funding agencies, and researchers particularly mentioned learning from their colleagues about how to apply successfully for projects. Faculty academics were aware that the university's central Technology Transfer Department was available to provide support for technology transfer projects, through ambassadors from this office who have now been located in the faculties and institutes. This department provides particular support services in the preparation of agreements and contracts concerning co-ownership, licences and intellectual property.

4. The team recommends that BUT seek out industry collaborations on research that will lead to publishable knowledge

The SER Annex 4 (p34) lists an increasing number each year of BUT publications produced in collaboration with industry, as identified in the Web of Science database. The team saw a report of a large (EURO 30 million) research project in Advanced Materials funded from European Structural Funds. The Faculty of Civil Engineering informed the team about their Industrial Board and their many collaborations with companies. The team heard evidence of BUT's high reputation researchers and impact factors in some areas of publication and industry.

The team heard from industry stakeholders whom they met that they perceived BUT more as a teaching than a research institution, and that technical universities generally did not have a strong reputation for research. It is therefore a challenge for the university to change this perception and present itself to industry as a research partner. Stakeholders expressed a view that more foreign exchange activity, of both students and researchers, might help to open up the university and change this, as in the research institute CEITEC. Stakeholder representatives were aware of the Rector's agenda to strengthen BUT's research capacity, and were optimistic that under his leadership there would be greater development and knowledge transfer from research programmes. In their view, there was generally not a strong tradition in the Czech Republic of collaboration with industry on publishable research. The SER (p17) also highlights Rector's aim for more publications to be derived from contract research, within the constraints of commercial confidentiality.

New observations

The team heard that the new leadership of BUT had a strong emphasis on research, with a new vice-rector for research appointed, and that the emphasis on developing high quality research had been discussed in Senate. BUT has become one of six institutions in the Czech Association of Research Universities and is strongly aware of the importance of international networking in research partnerships.

BUT is mindful of the importance of quality indicators for international rankings in research. The team heard of the Rector's intention that these standards will be used to measure progress of the faculties in research performance, as part of the drive for specialist areas of excellence comparable to EU institutions. The university is actively preparing to undergo research evaluation next year under the new national assessment methodology (17+), which extends beyond measuring publication metrics to include the peer review of social impact and other indicators. The outcomes of this exercise will be important for the university in terms of potential financial and reputational benefits.

The Rector's plans include the vision to further strengthen the research community in all faculties. This can be an issue for universities where there are very different faculties, with different numbers of students and therefore resources. It will be important for BUT to find mechanisms for faculties and institutes to share experience and good practice in developing excellence in research, in the context of the methodologies for national research evaluation and international rankings. The team therefore recommends that BUT **investigate and sustain more development of research in all faculties.**

6. Service to society

1. *The team recommends that BUT foster an entrepreneurial mindset in more graduates*

The team heard from external stakeholders and employers that they had good links with BUT and were keen for BUT to bring more technology students into the region. The South Moravian Innovation Centre works closely with the university in support of entrepreneurship in students, for example by helping with start-up ventures. The SER (p16) outlines a project to promote entrepreneurship for students called 'Let's Do Business!', which has included the design and delivery of a university-wide course 'Business Ideas Development and Realisation' by the faculty of Business and Management in collaboration with experts from the regional Innovation Centre. Entrepreneurial skills are also provided by some Master's courses, as an elective.

A representative from an Arts organisation, which currently employed six graduates from the Faculty of Fine Art, highlighted to the team that arts students would benefit from more interdisciplinarity in their programmes, including the study of finance, in order to foster a more business-minded approach particularly in those who would have careers other than as professional artists.

Employers in the region had reached an agreement that students they employed would be required to complete their studies, as a condition of their continued employment. This is very helpful in supporting the university to retain its students and in enabling them to achieve their qualifications.

2. *The team recommends that BUT sustain and expand where possible the cooperation with schools, involving both staff and pupils*

The team was told that there were challenges nationally in attracting school students to study in technical universities, and that without proactive involvement it would be difficult to achieve an increase in applications for engineering. BUT's main competitors were not necessarily other technical universities, but social sciences, humanities, medicine and other subjects in other types of university. Industry representatives also acknowledged the challenge for the technical universities to attract young people to the study of technology, which school students often considered difficult.

The team heard that BUT had launched several significant initiatives to raise and maintain the interest of potential young recruits. The SER (p21) gives examples of various projects targeting both primary and secondary school pupils.

The team heard some strong examples of faculty cooperation with schools. In the Faculty of Civil Engineering, a vice-dean is responsible for leading outreach activities with schools to promote interest of young people in civil engineering, in which there is a lack of specialists in industry. Although there are some designated high schools for civil engineering, the faculty believes it has significant opportunities to increase the number of students by recruiting from the general high schools. Recently the faculty has established a key contact person for each high school and developed a programme for school students to spend a day at the university on a range of activities designed to engage them with civil engineering. The faculty then aims to ensure that it follows up on this activity, including maintaining contact through social networks. Each year, the faculty also organises a competition involving PhD students leading activities with groups of secondary school students, which the team heard that could lead to successful school students being awarded an unconditional place to study in the faculty. Academics from one department told the team that their cooperation with secondary schools included updating the teachers on new developments from industry, but that there was more work to be done generally with schools.

The team recommends that BUT **continue to explore new ways of engaging school students of all ages in technology and engineering.**

- 3. The team recommends that BUT raise students' awareness of their societal responsibilities and activate them as ambassadors of their study field*

The team heard of instances of BUT's cooperation with stakeholders for the benefit of both students and society. Stakeholders gave the team several valued examples of students using their credit-bearing study projects for the benefit of society. In one project, students successfully contributed to improving the hospital environment for chemotherapy outpatients and their families. In further example, final year Architecture and Fine Arts students prepared building models and interior designs for another health facility. The stakeholder reported that these collaborations had been most helpful, and that they had a special contract with the university for this activity. In one case the project had formed the basis of a student's thesis.

The SER (p22) provides examples of BUT's social engagement in other specialist areas, such as ecology and sustainability, and of students' and employees' voluntary activities during the pandemic.

- 4. The team recommends that BUT offer more public lectures for a wider society and consider the possibilities for offering open online courses in due course*

Public lectures at the university are organised mainly through the University of the Third Age. These were primarily delivered online during the pandemic, but BUT considers that the target age group generally prefer the social aspect of attending in-person lectures (SER p22).

- 5. The team recommends that BUT consider the scope for expanding the offer of CPD for external professionals more systematically*

The SER (p22) describes the aim of BUT's senior management aim to establish a 'second age university' to increase opportunities for continuing professional development (CPD) through postgraduate education, an ambition also stated in the Rector's electoral programme. BUT belongs to a consortium working to define the principles for introducing microcredentials, and is well aware of their potential for increasing flexibility and access to study. This will require agreement over approaches to articulating credit, which the team was told currently vary both between and within universities, including BUT. Once this has been resolved, there would be greater potential to offer microcredentials for continuing professional development.

The team recommends that BUT **explore the development and delivery of microcredentials for continuing professional development.**

- 6. The team recommends that BUT continue to extend and expand upon the current broad impact on society*

For senior managers, becoming more connected and responsive to the needs of society was one of BUT's challenges and priorities for the future. They outlined the importance of BUT having a visible focus on relevant social topics, in order to highlight the role of technology research and the relevance of technical study programmes for society. This was likely to involve becoming more open to cooperation with other institutions in order to interface technology with other disciplines, such as social sciences. BUT has recently signed a memorandum of cooperation with the City of Brno on the development of electromobility and its use by the general public, creating also opportunities for students to focus on electromobility in their theses. Senior management is also committed to

responding to the European Green Deal, as BUT seeks to extend its visibility and reputation through participation in European initiatives.

The team heard examples of effective collaboration of BUT with local and regional authorities, including a collaboration between the Chamber of Commerce and the university on a science park to accelerate innovation processes. External stakeholders recognised the 'huge reservoir of intellectual resource' at BUT, and argued that the Czech Republic needed to capitalise more on commercialising the outcomes of research. Stakeholders encouraged the development of academic programmes that were more multi- and interdisciplinary, especially in terms of digital technology. While employers reported that the university consulted with them informally when designing new study programmes, a view was expressed that the academic environment in general did not always adapt quickly to new developments in industry. There was strong interest from the regional representative in encouraging BUT to develop new programmes in response to the opening of new businesses or factories in fields where there was a shortage of expertise, for example in semi-conductors.

BUT also has a cultural presence in society, through its expertise in art, design and architecture, and a new Art, Design and Architecture Board has been established. However, the team did not see evidence the university taking a coordinated approach to its role in providing service to society, or specific plans for this to be articulated as a coherent philosophy and aspect of BUT's public image and identity, whether in connection with engineering, the Green Deal, or contributions from the humanities. The team recommends that BUT **present and actively promote the university as an institution engaging with key current societal needs and issues.**

7. Internationalisation

1. *The team recommends that BUT analyse possibilities to reduce the deterrent of high fees for English taught study programmes*

BUT offers some programmes taught entirely in English. Both managers and academics whom the team met generally thought that there should be more, and that this would help to attract more international students. Currently, students must pay tuition fees to undertake these programmes. The team was informed that, from 2024, the Ministry of Education planned to make the charging of fees to foreign students a matter of decision by each university. It would then potentially be possible for BUT to make tuition free for studies taught in English, as it currently is for all students, including those from abroad, who study programmes in the Czech language. To implement this, the university would have to model how to compensate for the reduction in current fee income. Senior managers aim to expand the number of study programmes taught in English, while acknowledging that to do so will require communication on planning with the faculties. The team heard of one example of the development of a new Masters programme in Fine Art, to be taught in English.

One major barrier to inclusion of international incomers, that was repeated several times to the team, is the requirement in most study areas to be able to speak Czech. The team was reminded that many of BUT's foreign students are from Slovakia, and are generally able to study in the Czech language. However, because programmes taught in Czech are free, they also attract some foreign participants who, the team was told, sometimes struggle to maintain progress in their studies due to difficulties with understanding the Czech language. The team heard that some faculties therefore provide courses in the Czech language, although not all students took advantage of this due to lack of time.

2. *The team recommends that BUT investigate how numbers of incoming and outgoing lecturers could be more balanced, using foreign guest teachers as a starting point for more research cooperations, international teachers and students, joint and double degrees*

The SER (p25) outlines a range of activities and initiatives for promoting visibility of BUT abroad. The university also has fifteen joint or double degree programmes delivered in English, of which only six are currently active; the team heard that BUT plans to review this type of provision.

The emphasis of this recommendation was on increasing the number of incoming foreign teachers and researchers. However, the team learned that although there is now a mechanism for recording all 'Arrivals of foreign visitors, scientists and academics, these visits are not yet reliably or systematically recorded in a way that is comparable to outgoing staff. The SER (p26) states that from 2022/23, central methodological guidance will set the criteria for recording foreign visits to BUT.

International researchers informed the team that CEITEC, as a major research institute with advanced facilities and equipment, and highly regarded professors, attracted groups of international researchers and staff from different countries. This confirms that the Rector's emphasis on strengthening the international research reputation of BUT in specialist areas of excellence has potential for attracting more international teachers, researchers and students to those subjects.

3. *The team recommends that BUT develop some compulsory main programme modules in English for all students*

According to the SER (p26), BUT Study Programme Standards require the design of programmes to include at least one course taught in English, and the introduction of compulsory core programme modules taught in English is currently being discussed at BUT (SER p26).

4. The team recommends that BUT provide attractive, interactive courses in English communication for students

English language courses are delivered by faculties' own language departments. The team heard from students in one faculty that it was a requirement for them to pass a course in the English language in order to successfully complete their degree. Although not everyone passed at first attempt, it was possible to retake the assessment at various times during their course of study, so this did not generally present a barrier to achieving their qualification. Those who have already achieved the required standard of English have the opportunity to learn another language.

It was also suggested to the team that, given the geographical position of Brno, and links with industry, it might be beneficial to offer and accept German as an alternative second language to English. Some students reported that, while acknowledging the usefulness of English for employability, they were also aware of links with other national companies, and would like the opportunity to graduate in a language other than English or Czech in order to increase opportunities to work abroad, for example in Austria or Germany. The team recommends that the university **foster students' interest and awareness in extending languages and international mobility.**

5. The team recommends that BUT strengthen central welcome and support services for international students and staff

BUT has established a Welcome Service to support incoming staff arriving in the Czech Republic for long-term visits. This service familiarises staff with the formal requirements, such as visas, insurance, travel and registration with the Ministry of the Interior, with information summarised on the website and in a video.

The team heard from both Czech and international students that they felt there was room for improvement in the university's services for incoming international researchers and students. They believed that with better support and care of those who came into their faculties for one or two semesters, there might be an increase in international students at BUT. The team heard from one group that they looked forward to the new Vice-Rector for Internationalisation introducing a new agenda and were optimistic that there would be changes. The Vice-Rector for Internationalisation reported that she was consulting with colleagues on how internal services might be improved for international students. This included exploring ways of proactively communicating with potential students from their point of application, linking them to an identified contact person.

Listening to international students and researchers, the team discovered that for those coming in from abroad, including Erasmus students and researchers, navigating factors such as health or social services in Czech society could initially be more important and pressing than study issues. The team heard of an example of two researchers having left early because of difficulties in finding medical support, and also that students can struggle to find appropriate accommodation. It was suggested that an accessible collection of essential information about life in the Czech Republic would be both welcome and beneficial. It appeared to the team that, without a more integrated approach to the organisation of services for international incomers, the university might risk losing some students and researchers. Strong organisation, or even direct provision of, services such as medical support for international students and staff from within the university would be a great advantage for BUT. The team recommends that BUT **provide comprehensive information and services for international students, researchers and staff to support their adaptation to life in Brno.**

6. *The team recommends that BUT provide all information for students and staff also in English*

BUT is keen to recruit more international staff, and in its action plan has noted the need for all information and materials to be readily available in English. The team was told that progress has been made in this work, but that more remains to be done. Recruitment of more international academic staff would enable the institution to offer more programme and modules in English. At the time of their visit, the team was told that there were 193 students on programmes of study delivered in English, and that BUT plans to extend its activities by offering programmes in its most competitive subject areas. CEITEC, as a specialist research institute, has particularly strong international representation in both staff and students. This is in part because additional project funding enable higher salaries to be paid.

It was thought by students and researchers that the university might find it difficult to organise an international association at institutional level, but that it might be more pragmatic to do so at faculty level; since this was where students had their closest links, and it would be easier to promote a sense of belonging more locally. The team recommends that BUT **strengthen inclusiveness of international students within BUT.**

7. *The team recommends that BUT offer its teachers specialist courses in how to teach their subject in English*

The SER notes (p27) notes that improvement in language skills was one of the areas addressed by the MOST project, where specialised courses focused on teaching English in their field. The team heard from managers that BUT was encouraging both academic and administrative staff to improve their English language skills, and offers courses through the Lifelong Learning Institute. The faculties the team visited also both offer English language courses for their staff, particularly to create potential for greater mobility and international research collaboration.

New observations

The institution is currently reviewing its approach to international recruitment, to consider a wider global market and determine which countries to target as priorities in the context of the changing geopolitical landscape. The team heard that, led by the new Vice-Rector for Internationalisation, BUT has undertaken an analysis of potential partners, both in Europe and worldwide with which to build cooperation. The university also works with recruitment agencies, and faculties have their own international links through which they promote their research to attract more students. There was an increasing focus on developing marketing strategies, and on improving institutional rankings in order to attract more international students. BUT management is considering the optimum number of international students to recruit in terms of the balance between economic sustainability and investment. There is potential to use the strategic development funds to support this activity. The team recommends that the university **coordinate activities between faculties and central level to improve position of university in international and national rankings.**

The team heard from Czech students who had studied abroad under the Erasmus programme that they had greatly valued their experience and would encourage others to do the same. However, they had experienced an issue over a lack of recognition of credit from these studies towards their BUT degrees, possibly associated with professional requirements in some technical subjects. Faculty staff also commented that, for Erasmus to operate effectively for students, engineering programmes needed to be compatible with those abroad, but this appeared to be an issue for students in practice. The team heard from senior staff that there were difficulties in finding a common view of what 10 or 15 credits meant in different universities in the Czech Republic and beyond, and that the university

itself also needed to find a common approach to unifying how students' volume of learning is expressed. The team concluded that this limited flexibility of BUT programmes was likely to be hampering student mobility, and that institutional accreditation might provide the institution with an opportunity to address this issue by increasing the flexibility of its study programmes and the recognition of credit transfer from studies abroad. The team therefore recommends that BUT **increase the adaptability of its study programmes to support student mobility.**

Finally, the team noted that increasing internationalisation was a high priority for BUT. While acknowledging the wide remit of Senate and the extent of its responsibilities, the team suggests that Senate, as the main body with oversight of institutional strategy and management, should regulate work with these issues. The team therefore recommends that BUT **consider mechanisms for Senate oversight of progress with internationalisation.**

8. Conclusion

The team concluded that, overall, BUT had made very good progress against the recommendations from the 2018 institutional evaluation. Particularly in the context of recent and current external challenges, the team found that the university is in general doing very well. The senior leadership has a strong awareness of the external environment and the positioning required for the university to become competitive in this context, including the importance of excellence in research and increasing internationalisation. The university is open to responding to the challenges of societal needs, through collaborations both locally and further afield.

The approach of the new management is clearly focused on results and outcomes, and the team formed the impression of a consultative, participatory style of leadership. The team met many enthusiastic and committed staff who are ready to engage with the new strategy, and who show a sense of pride in belonging to the BUT community. Students generally appreciate the learning environment, the support and of staff, and the opportunities offered by BUT.

Summary of the recommendations

Governance and institutional decision-making

- Continue the positive work in progressing towards full implementation of consistent use of information systems and data in decision-making

Quality culture

- explore opportunities for increasing flexibility in adapting and updating programmes in response to feedback within their approved 5 year period
- continue to consider possibilities to promote informal and formal ways of improving consistent quality culture at all levels of the university community
- explore mechanisms to share good practices in using student surveys

Teaching and learning

- invest in the systematic promotion of pedagogical training and continuous development for all academic staff
- investigate possibilities for interdisciplinarity and elective courses at all study levels

Research

- explore more widely the potential for interdisciplinarity in research
- investigate and sustain more development of research in all faculties

Service to society

- continue to explore new ways of engaging school students of all ages in technology and engineering
- explore the development and delivery of microcredentials for continuing professional development

- present and actively promote the university as an institution engaging with key current societal needs and issues

Internationalisation

- foster students' interest and awareness in extending languages and international mobility
- provide comprehensive information and services for international students, researchers and staff to support their adaptation to life in Brno
- strengthen inclusiveness of international students within BUT
- coordinate activities between faculties and central level to improve position of university in international and national rankings
- increase the adaptability of its study programmes to support student mobility
- consider mechanisms for Senate oversight of progress with internationalisation