LTSHE

Learning and teaching space in higher education

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KEY ACTION

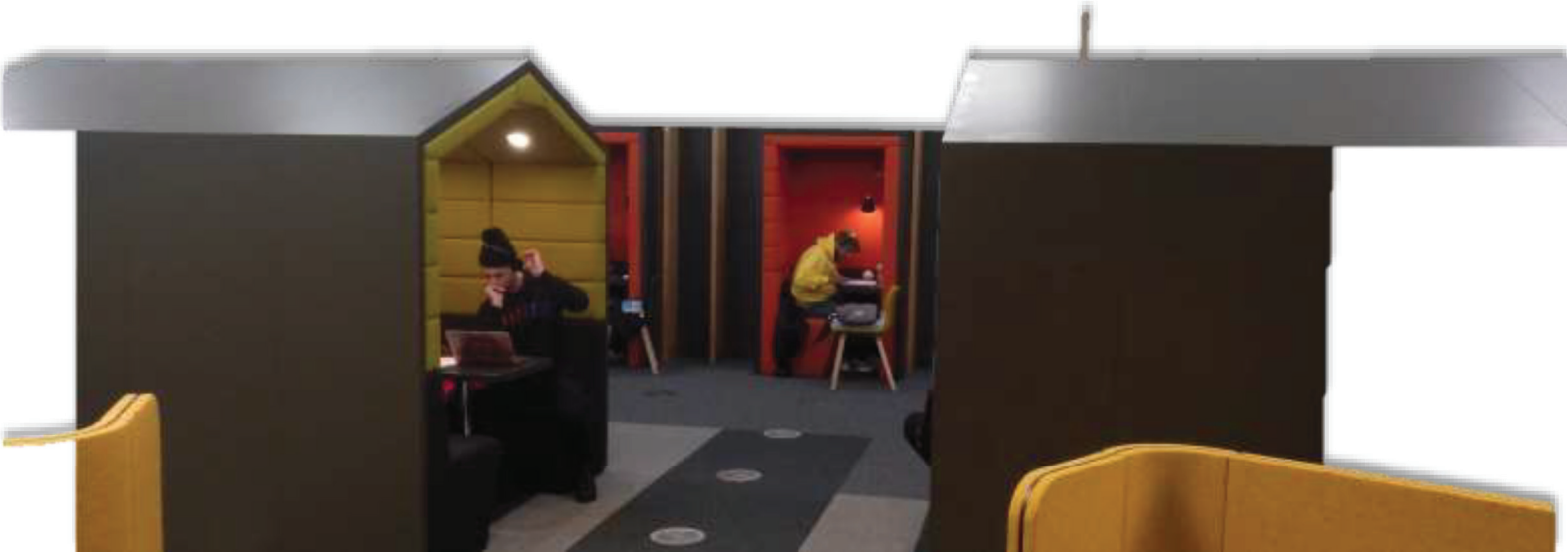
Cooperation for innovation and the exchange of good practices

ACTION TYPE

Strategic Partnerships for higher education

WEB INFORMATION

https://ec.europa.eu/programmes/erasmus-plus/projects/eplus-project-details/#project/2019-1-UK01-KA203-061968
https://www.evalag.de/ltshe



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INTELLECTUAL OUTPUT 2

Case Study of Experience: designing, developing and using learning and teaching spaces in Polish higher education

The Case of the Jagiellonian University

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Executive Summary

For many years the issue of the quality of learning and teaching space (L&TS) has been neglected in academic and/or professional discussions. The need for well-designed university buildings and properly equipped lecture halls and laboratories were taken for granted and caused almost no serious discussions. The national regulations, sometimes regulating particular problems of higher education in a very detailed way, are very relaxed in defining what universities and colleges must provide to respond to the needs of 21st-century students.

Polish Accreditation Committee (PAC), a national statutory agency responsible for higher education quality assurance, relies heavily on the understanding of the quality of L&TS by individual experts engaged in accrediting programs of studies. Very general and ambiguous requirement of providing adequate L&TS, "corresponding with the needs of teaching-learning process" and enabling "achieving all assumed teaching-learning goals" provides almost no suggestions on how to design, organize and/or modernize the space used in the teaching-learning process. The combination of the absence of academic discussions on innovative L&TS and ambiguity of national regulations and recommendations (i.e., PAC documents) results in difficulties the Krakow Team has experienced while researching the issue: it was hard to find common ground in naming existing problems or praising most promising solutions.

While interviewing various stakeholders of the Jagiellonian University, Krakow Team has experienced some differences between the rhetoric and the reality of L&TS. On many levels, from the top managers of the institutions to the supporting staff, one can observe that on the one hand, the University is providing access to research and learning, which translates into the appropriate design and organization of all the spaces. While on the other hand—one can hear about many problems the university, as well as faculties and departments, have to face, such as poorly designed common space for the general use of students. Across the university these common spaces are furnished with a random collection of disused furniture from some classrooms, moreover, there are no electric sockets next to these tables provided, which makes working there difficult.

The voice of the students of the Faculty of History (nicely located in historical buildings, some of them medieval) reflects the understanding of the obvious limitations: one cannot reshape these buildings into modern, 21st century steel and glass types of halls. At the same time, these very same buildings show the actual lack of history in the common spaces.

There is a generally very positive perception of the adoption of the university to the challenges posed by COVID-19 and going online. Administration, academic teachers, and students found the use of digital space very promising. The use of institutional Moodle platform (Pegaz UJ), MS Teams, and (rather rarely) Cisco's Webex enabled the university to transfer teaching activities into digital space. Yet still, not all opportunities brought by the extensive use of digital tools were fully appreciated and employed. All but too often the classes were "direct translation" from physical into virtual space, without taking into consideration the actual functionalities of digital platforms. Many of the classes remained teacher-oriented and lacked the optimal level of personal interactions (especially, among the students themselves).

There is also one very important aspect that the Team observed in Kraków: learning and teaching space is perceived mainly through the lenses of its primary function: as the space where students can learn, where they can conduct their experiments under the careful guidance of teachers. Discussion with the architects proved that the role university space can and should play in city landscape is largely overlooked. Even the “New Campus” located in the Ruczaj neighborhood, one of the most costly capital investments of the University, was not designed as the space to be shared with the city, with the people living in the surroundings.

All in all, the research completed by the Team in Kraków has proved that the issue of learning and teaching space remains an important problem and there is vast space for improvement. The examples and achievements of other universities, located in other European countries could be of great value for the future development of L&TS in Poland.

1. Introduction

The Introduction

Learning and teaching space (L&TS) understood as a driving force for quality improvement in higher education is a relatively new concept in Poland. The national regulations made it mandatory that institutions of higher education can offer “proper” or “appropriate” teaching space but their regulations have never defined the actual meaning of “proper” or “appropriate”. Polish Accreditation Committee (the national statutory body responsible for higher education quality assurance) during its on-site accreditation visits focuses on evaluating if a higher education institution (HEI) provides space equipment “corresponding with the needs of teaching-learning process” and enabling “achieving all assumed teaching-learning goals”. Therefore it is the responsibility of the experts themselves to judge if an HEI meets the criteria of providing adequately prepared L&TS.

On the one hand, such a lack of precise regulations and/or definitions is something positive, because it does not infringe institutional autonomy. On the other hand, however, it makes any discussion about the quality of L&TS in Poland more difficult, because it is not possible to find any solid, widely accepted reference points. This state of “liquidity” in approaching the needs of teaching and learning space was further reflected in the interview conducted at the Jagiellonian University in Kraków: many of the interviewees were not sure what the concept of “teaching and learning space” means as such and what should be taken into consideration while evaluating its quality.

While the team was conducting the interviews it was also a bit difficult to get the answers from the supporting staff. And the main reason for this was simple and rather astonishing: for many of them, it was the first time ever anybody asked for their opinions about the quality of L&TS. Anyway, the completion of the investigation proved that the issue of L&TS should be fully addressed not by the Jagiellonian University but also by other HEIs in Poland. Trends already visible and solutions already tested at foreign universities could be not only inspiration but more like a blueprint for the necessary improvements in Poland.

Polish team found it especially rewarding and inspiring to notice differences in approach to the evaluation of L&TS among various groups of stakeholders. Contrasting the responses of various groups provided broader and more critical insight into the nature of teaching and learning space in general. Sometimes, it was especially interesting to notice how differently the same space could be evaluated by different groups. There was one sober observation of the architects: they bluntly understood that the university is the ultimate investor and has always the final voice in making any decisions. This results in eliminating many of the innovative proposals that were increasing costs, even only slightly.

In general, the process of designing learning and teaching space proves to be very centralized with the top administration (e.g., rectors and deans) being responsible for final decisions and the process is not organized in a participatory way: the university does not try to hear the voices of various groups of internal (supportive staff, teaching staff, even students) and external (e.g. local government) stakeholders.

The situation of Jagiellonian University is not unique. The knowledge of the team, also the knowledge acquired thanks to some other project members of the Kraków team are engaged, proves that very similar problems are common among Polish HEIs: the process of designing new and improving existing learning and teaching space is not founded on wide participation principle. This also results in a very institution-centered approach to architectural design: there is a lack of understanding of the impact new university buildings and university landscape could and should have on the city.

2. Theoretical issues

As it was stated in a previous chapter—in Poland there has been very limited discussion about the role and place of teaching and learning space. Therefore, in the Polish context, it is hard to name any particular publication, report, or even the experience of other universities that have influenced the present approach to designing L&TS. The groups of architects commented that the main inspiration for their work was study visits to the university campuses around the world. The architects had no problems in naming many university buildings they considered top-class learning and teaching spaces but with the limitations they face in Poland, it is difficult to promote an innovative approach to L&TS.

The only publication on designing L&TS the Team identified is the paper "Jakość przestrzeni publicznej w budynkach wyższych uczelni. Praktyczne zastosowanie metody POE w badaniach jakościowych w architekturze" ("Quality of public space in higher education buildings. Practical application of POE method in quality assessment in architecture"). But this publication focuses on the "Post Occupancy Evaluation" and on the "Learning Landscape" as a public space, with limited focus on learning and teaching as part of university activity.

The results of the work of the Team have proved that the university space/campus is rather not considered to be a subject of political debates. The local authorities have almost no influence upon the ultimate shape of the L&TS and the idea of creating landmark architecture is almost non-existent. The main (and almost the only) task of the local authorities in designing L&TS is to grant construction permission. Very rarely do cities provide grounds for new capital investments, as was the case of the Jagiellonian University, resulting in the creation of the so-called New Campus.

Although we have quite a vigorous discussion about higher education and higher education quality in Poland, it does not translate into a better understanding of the impact new pedagogical approach and technological development have had on learning-teaching processes and how learning and teaching space should be part of such educational progress. As it was already stated, such a lack of understanding is also visible in higher education quality assurance procedures. From the point of view of the Polish Accreditation Committee, it is far more important that L&TS follows the existing paths. The innovative, new types of learning and teaching space could help Polish HEIs to get extra certificates, however, the universities must pay more attention to providing a proper number of seating space, beamers, wi-fi, and other basics of this kind, because it is what the experts of Polish Accreditation Committee are eager to check.

Even the experience of COVID-19, forcing the universities to offer online teaching, has not changed the approach to the "digital space". As it was commented by one of the members of supporting staff (IT support), one of the buildings that was completely remodeled and renovated proved to be ill-equipped with necessary Wi-Fi infrastructure: neither students nor teachers could not have stable, fast internet connections. That resulted in many disruptions when students came back to classrooms.

3. Methodology

The research for IO2 has been conducted between July 1, 2021, and October 30, 2021. Respective stakeholder groups comprised the University authorities and managers (heads of different faculties and interdepartmental units), Quality Management staff, academic teachers and students, as well as estate staff, ICT staff, and architects.

The ongoing lockdown, essentially continuing until the end of September 2021, posed the greatest challenge, as it ruled out the typical face-to-face meetings of the people who do not work together on a daily basis. Since the Authors work at different departments and could not meet most of the respondents in person within this period, the initial part of the interviews was carried out online, using the digital tools for online meetings that are available at the University. The guided focus group discussions with students, which took place in October, were mostly conducted in person. The outcomes of the discussions were gathered in four open-access documents, where the students participating in the focus groups were asked to add their afterthoughts or additional comments that they thought of up to a week after the meetings.

The University authorities, including the Rector and the Deans/Directors of interdepartmental units and the Quality Management staff, have been approached between July 1, 2021, and September 30, 2021. The interviews covered such a long time span due to the fact that it was the time of the academic break after the end of the summer exam session and the meetings were organized depending on the person's availability. The semi-structured interviews were organized along with a number of pre-determined questions which were flexibly used by the interviewer as appropriate to the course of the discussion and the respondent's knowledge and experience.

The teachers and the non-teaching staff directly involved with L&T were interviewed in September 2021 in a series of semi-structured discussions. The same method was used in the interviews with the architects and the estate staff, conducted in October 2021. All these interviews were organized along with a number of pre-determined questions which were adjusted to the course of the discussion and the respondent's knowledge and experience. The interviews proved to be very fruitful even though most of the respondents pointed out that the first question (about innovative approaches to L&T) was too general for the purpose and they had difficulty finding the right answer at first. The impact of the three semesters of remote L&T was clear, as they focused on the digital structures and emphasized the solutions that can be transferred into the classroom or blended learning conditions.

Students were approached in October 2021 in a series of face-to-face semi-structured focus group discussions, followed by a short written summary in an open-access document to which everyone could contribute. They were divided into 13 groups of 10-15 people, representing various faculties and different cycles of studies:

- The Faculty of Management and Social Communication, the Institute of Culture and Media Management, master studies (2nd cycle of studies): 4 focus groups;
- The Faculty of Management and Social Communication, the Institute of Culture and Media Management, bachelor studies (1st cycle of studies): 2 focus groups;

- The Faculty of Management and Social Communication, the Institute of Film and New Media, bachelor studies (1st cycle of studies): 1 focus group;
- The Faculty of Chemistry (a cross-section of institutes), master studies (2nd cycle of studies): 1 focus group;
- The Faculty of Philology, the Institute of English Studies, bachelor studies (1st cycle of studies): 2 focus groups;
- The Faculty of History (a cross-section of institutes), master studies (2nd cycle of studies): 3 focus groups.

The choice of the faculties and institutes reflects the various fields that are taught at the Jagiellonian University, which entails various needs and expectations of the students as far as L&T space arrangement is concerned. Moreover, the faculties comprise the examples of good practices to emulate by all the other units (Chemistry), as well as bad practices: the underdeveloped spaces that is an opportunity yet to be completed (Management and Social Communication). The students from the Faculty of History, residing in the historical, centuries-old buildings, inevitably offer a different point of view than the ones studying in new or modernized buildings. Finally, the master students, many of whom are graduates from other universities, can offer a fresh look at the Jagiellonian University and its L&T spaces, as they can easily compare them to the HEIs where they studied before.

In addition to the abovementioned focus groups, one structured interview was conducted with a student from the Institute of Economics, Finance, and Management (the Faculty of Management and Social Communication). Since this Institute is one of only a few institutes offering full courses in English and welcoming many foreign students (who may even outnumber Polish students in some cases), it was deemed that his perspective may differ from the perspectives of the students participating in the focus group discussions.

Interviews in numbers:

- The Rectorship: 1 interview;
- The Deans and Directors of interdepartmental units: 4 interviews (the Faculty of Chemistry, the Faculty of Law and Administration, the Faculty of International and Political Studies, the Director of a Doctoral School);
- QM staff: 2 interviews;
- Non-teaching staff: 1 interview;
- HEI estate staff: 1 interview;
- Teachers: 6 individual interviews;
- Students: 13 focus groups (10-15 people each) + 1 individual interview;
- Architects: 1 interview.

The data gathered in the course of the interviews and online questionnaires have been confronted with the documents available on the Jagiellonian University website

(www.uj.edu.pl/en), concerning the main premises of the University's activity (such as the Strategy and the Vision 2021-2030), as well as the details of the working of the University units (e.g. the Distance L&T Centre or the Disability Support Service) and the relevant documents issued by the JU authorities. In addition, a scientific paper on the management of the JU area published in 2020 has been taken into consideration, as it presents similar findings as the ones there were the aim of this research but seen from the students' perspective solely. All of the abovementioned documents have been analyzed using the key search terms connected with space arrangement and management.

4. Institutional policy and practice for the design, implementation, and use of L&T spaces in the Jagiellonian University

The Jagiellonian University comprises 16 faculties located both in historical buildings in the city center (some of the buildings are major historical sites themselves) and in the newly-erected campuses, completed in 2017 (Ruczaj) and in 2020 (the University hospital and the Medical College didactic spaces in Prokocim). It includes state-of-the-art infrastructure where researchers can pursue their academic interests in a variety of fields, as well as centuries-old spaces, whose modernization is often inhibited by the laws of monument protection. Therefore, the consideration of L&T spaces in the University must be at least two-fold, taking into account these circumstances.

Additionally, the changes and innovations in remote L&T forced by the outbreak of COVID-19 pandemic led to the substantial development of the existing online platforms, thus paving the way for more efficient blended and hybrid learning and teaching after the restoration of mostly stationary education, while upkeeping the distance form of education in some institutes or faculties.

4.1 Policy and strategy for the design and implementation of L&T spaces

The Development Strategy of the Jagiellonian University for 2021-2030 is the most important document of the University's development policy. It defines the goals and directions of the University's growth in its immediate and further surroundings until the year 2030. The document was prepared by a team working under the supervision of Prof. Jarosław Górniak in cooperation with vice-rectors, chancellors, and quaestors. It was approved by the resolution number 71/VI/2021 by the University Senate.

As stated in the Strategy, the development of and investment in research infrastructure is one of the priorities of the University. The funds for this purpose will be partially acquired from external investment funds. It is also assumed that the existing research infrastructure should be shared with independent partners, not affiliated with the JU. In addition, further development of digital tools is planned. A coherent policy for the purchase of databases and software licenses will be implemented. However, no details concerning the development of physical L&T spaces are given. Research is defined as the key area for the University, which entails the purchase and/or application of state-of-the-art equipment and technologies, yet this fact is only stated in general terms, without specifying much.

Likewise, the University Mission, prepared by the same team in 2021, states that the University is in the service of society by conducting research and education while always seeking the truth. It constantly develops as a research university, it creates excellent conditions for research and education, and it achieves remarkable results in this area. At the moment, the University continues its transformation into a modern research university, which aims to be the educational leader in Central-Eastern Europe. It creates a friendly environment for researchers, and it particularly supports scholars conducting interdisciplinary studies. The development of technical and technological infrastructure to support the didactic process is one of the main goals of the University for the next decade, as it will greatly enhance L&T.

The Mission defines the development of the infrastructure as the growth and the modernization of the equipment and the buildings for conducting research. The investment in the new spaces and the repair of the existing ones will improve the L&T conditions, particularly in the case of the University units based in outdated and obsolete buildings that do not correspond with the needs of the faculties. The expansion and modernization of the Medical College will continue, with new research and didactic facilities already planned in the area. The University libraries will be further unified, both digitally and physically (as far as possible and practical), which will help provide more space for the vast stocks.

The "Excellence Initiative - Research University" program embraces a strategy implemented by Jagiellonian University which aims at strengthening the university's international recognition. The efforts to achieve the status of a sustainable research university will primarily revolve around the development of its international partnerships, research grant support, innovation of research and education, the advancement of social responsibility, globalization of science, as well as the transfer of knowledge and technology. On the basis of the SWOT analysis, 7 Priority Research Areas (PRAs) with enhanced research capabilities were selected reflecting the potential for research development of Jagiellonian University: Heritage, FutureSoc, BioS, qLIFE, SciMat, DigiWorld, Anthropocene. These areas will be prioritized, but the details of the program are yet to be defined by specific projects that are contained in it.

Common spaces for cultural, recreational, and integrational use are also defined in the University Mission as the key areas of planned development. It is necessary to designate such spaces both indoors and outdoors, as they will serve as both cooperation and meeting areas, crucial for the academic community. It is also emphasized that the availability of all the spaces for people with special needs will constantly be increased in order to make the University an open and friendly space that welcomes everyone.

Simultaneously, though, it must be remembered that the Jagiellonian University comprises buildings of the greatest historical value. Some investments are already being carried out and new ones are planned aiming at the preservation of the heritage spaces. Also, IT infrastructure is developed that could document, disseminate and safeguard the material and non-material heritage of the University.

The availability of the spaces and the L&T process is an important part of the University policy. There is a special unit, the Disability Support Service (DON - https://don.uj.edu.pl/start), aiming to provide equal opportunities for persons with disabilities through the development and implementation of reasonable adjustments to ensure their equal treatment in access to education. The process of introducing the adjustments has been regulated by the Ordinance No. 150 of the Rector of the Jagiellonian University of 22 December 2020 on adapting the process of education and research to the needs of persons with disabilities and in special health circumstances. This procedure specifies in detail the decision-making procedure in cases of persons with permanent or temporary disabilities. It should be emphasized that Jagiellonian University is one of the few Polish universities where this process is strictly regulated. The Rector’s Ordinance gives students the right to apply for a range of specialist services and adjustments, while also specifying the responsibilities and deadlines that the student must meet in order for this support to be reasonable. This Ordinance is pursuant to Article 23(1) of the Higher Education and Science Act of 20 July 2018 (Journal of Laws of 2020, item 85, as amended).

All the rules, the operating hours, and the address is specified on the Disability Support Service's website. The building itself offers a variety of spaces well-adjusted to the needs of the students seeking support there. The Student Zone is the first contact point between the students and staff of the Disability Support Service. In the room dedicated to individual meetings, private consultations are held with our educational advisers which focus on the student's specific situation at the University. The space offers conditions for exchange and sharing in a completely discreet manner.

The Disability Support Service also offers some L&T spaces for specific uses. The training room is home to various training programs for academic teachers and other professional groups keen on improving their competences as regards supporting students with disabilities. The subjects covered concern various disabilities, educational problems they can bring as well as operational methods which reduce the consequences of such limitations. The training schemes aim at building disability awareness through dialogue, group discussions, and active methods. In the training room presentations are also held of the e-learning course developed by the DARe-Learning project, which academic teachers can use online regardless of the in-class training on offer.

In addition, there is a dedicated multimedia workroom for foreign-language learning where such courses are delivered for students with hearing and sight disabilities. The teachers and students can use an interactive board, a PC with specialist software supporting the board, and a projector. With deaf and hard-of-hearing persons in mind, laptop computers have been provided for written communication and a teacher-operated light-based system for calling the students. After the course meeting, the students receive electronic-format notes. During the course meeting, blind and partially sighted students make use of high-quality equipment to play sound material. The workroom is also equipped with a tactile map of Europe and Krakow hanging on the wall and mock-ups of the city's historical monuments made in such a way as to make their shapes visible to blind users. Such aids are used to stimulate imagination and language learning. The multimedia workroom has also space for wheelchair users who can access the building and participate in course meetings without any hindrance

Finally, the University aims to counteract climate change and participate in environmental protection by implementing certain changes in the physical spaces, such as:

- investment activities aiming at maintaining the greatest possible biological variety;
- limiting felling of trees on University grounds;
- making the facilities as energy-efficient as possible;
- building eco-friendly systems supporting the power supply with energy from alternative sources (e.g. solar panels);
- conducting an analysis of achieving zero-emission for University buildings;
- creating pocket parks at the University grounds;
- creating solutions conducive to sustainable transport: cycle lanes, bicycle service stations, roofs over bicycle racks, electric car chargers.

Such solutions are already being implemented in the newly-constructed buildings as well as in the modernized ones.

The digital side of the didactic process has been described much more precisely than the physical L&T spaces. The University Strategy emphasizes its importance, and it names the development of innovative digital didactic forms (such as e-textbooks, paid MOOCs, specialist online courses, and workshops for students) as one of the key assumptions for the years to come.

Many of the formal foundations for remote, hybrid, and blended L&T were laid after the introduction of lockdown following the outbreak of the COVID-19 pandemic. These are legal acts both on the national (ministerial) and the University level. The key acts, listed chronologically here, include:

- Announcement number 28, issued by the Vice-Rector for the HR and Financial Policy, about classes included in the syllabus as stationary, which are necessarily (due to the pandemic) changed into online ones (9th October 2020);
- Announcement number 29, issued by the Vice-Rector for the Didactics, concerning the technical and legal aspects of remote education (16th October 2020). It details the available platforms for online learning and teaching, and it outlines the limitations to recording such classes and lectures;
- Resolution 88/X/2020 of the JU Senate on the terms and conditions of participation in lectures and classes (28th October 2020). It states that the principle of openness of lectures at the Jagiellonian University does not apply to the ones conducted using electronic means of communication;
- Rector's ordinance number 131 on the rules of the organization and verification of the learning outcomes specified in the study programs with the use of electronic communication devices (17th November 2020);
- Announcement number 37, issued by the Vice-Rector for the Didactics, on the use of recordings of lectures and classes by students and doctoral students (10th December 2020). It contains information on the University's copyright to all the recordings and their protection;
- The new regulation of the Minister of Education and Science on the temporary limitation in the functioning of some entities of the higher education due to the prevention, counteraction, and combating of COVID-19 pandemic (25th February 2021);
- Rector's ordinance number 53 on the organization of education in the academic year 2021/22 (24th May 2021). It specifies that the education will be mostly stationary, with elements of remote learning and teaching. By 10th September 2021, the Deans are supposed to issue a detailed list of lectures and classes in their Faculty and the form in which they are going to be conducted.

In addition to these, the Deans of Faculties and/or the Directors of Institutes issued their announcements, giving detailed instructions to the teachers and the students on the specific aspects of remote education, such as the form of study records and other documents, the dates of announcing the formal course requirements, etc.

The Jagiellonian University had a variety of digital spaces and structures even before the COVID-19 pandemic, yet it was only afterwards, in the aftermath of lockdown, that they were tested to their full capacity. The digital spaces allow for both synchronous and asynchronous learning and teaching. They can be used separately or they can complement each other. Among the most popular platforms, there are Pegaz (which is the generic name for the University Moodle platform), complete with Big Blue Button, Microsoft Office 365, together with Teams and Forms, Krakus and Jaszczur (other Moodle platform, used mainly as a repository). Moreover, there are a few less popular platforms for online communications, such as Webex, to which teachers and administrative staff can obtain access for example to hold meetings in case other platforms are overloaded at a particular moment. Most importantly, all of the platforms are interconnected by means of the University parent structure, the USOSweb (the University Studies Management System).

The Distance L&T Centre (CZN - https://czn.uj.edu.pl/) is a special unit dealing with the promotion of remote academic teaching, supporting the development of new forms of learning and teaching, and helping lecturers in designing and conducting their courses online. The Centre runs regular courses and workshops for teachers willing to expand their knowledge about the available online tools. There are preliminary courses, introducing the idea of blended and hybrid learning and showing the basic capacities of the systems, as well as more advanced ones, focused on particular functionalities of the platforms. Since March 2020 the courses are held online, using Big Blue Button. The courses and workshops are typically organized in groups of 6, yet individual consultations are also possible. They are highly popular, which is shown in the statistics: between May 2020 and September 2021, 1/5 of the total number of the academic staff of the University participated in at least one course.

Furthermore, CZN has published a number of materials offering guidelines (in Polish and in English) on how to start working online, how to prepare materials, how to address technical difficulties, etc. Therefore, the aforementioned courses can be better suited to the real needs of the teachers, who have a chance to test the platforms before they contact CZN to ask for additional support.

The Jagiellonian University aims to be inclusive, which involves offering additional help to the students with disabilities, as well as to the teachers running courses for such students. The Disability Support Service (DON - https://don.uj.edu.pl/en_GB/start) offers help in designing and implementing educational process modifications suited to the needs of individual students in order to give them an opportunity to fulfill their academic obligations in a changed form. DON's offer has been extended to include remote education, as well. General guidelines for making online lectures and classes more accessible for everyone are published on their website. However, it is also possible to organize a course or individual workshops for teachers willing to learn more on the topic or seek support in introducing certain adaptations which could be more advanced on the technical level.

The University also offers a number of open educational resources, interactive or not, available to anyone free of charge. Some of them are open to anyone who clicks on the link, others require registration on the online platform. They cover a wide variety of subjects, from geography and climate change, through legal issues, to IT support. Moreover, most of them are available in

other languages apart from Polish: English, Spanish, German, French, Hungarian, and Norwegian. They can all be found at www.open.uj.edu.pl.

4.2 The existent new (innovative) learning and teaching spaces and their use

The University comprises 16 faculties that are located in different places in Krakow: some in the center, including the historical Old Town, some at the 3rd Campus in Ruczaj district, the Medical College in the new premises in Prokocim (since 2019), and some essential spaces, such as the astronomical observatory, the Institute of the Polish Diaspora, or the College of Physical Education and Sport in other locations, in or outside of Krakow. All these spaces have been described in detail in IO1. Therefore, only a brief overview will be included here.

As far as the University's physical spaces are concerned, the buildings can be divided into four broad categories:

1. Centuries-old historical buildings, with their inherent value as national monuments, but also with many limitations following from that fact (the Faculties: of Law and Administration, History, Polish Studies, Philosophy);
2. Old 20th century buildings, largely renovated, but with some limitations (e.g. due to the skeleton frames that cannot be changed);
3. New buildings, erected at the beginning of the 21st century – their construction is already partially outdated;
4. New, state-of-the-art buildings, meeting all the requirements of the desirable L&T spaces.

Table 1 illustrates the division of the buildings between the faculties.

Table 1 – Faculties and their locations

Types of buildings	Faculties
Old, historical buildings (monuments)	Law and Administration History Philosophy Polish Studies
Old buildings (up to 100 years old): • not renovated	Health Sciences Pharmacy Medicine – Dentistry Medicine – Nutrition and Dietetics Medicine (some classes)
• completely renovated	Philology International and Political Studies
The new campus – early stages (15-20 years old)	Management and Social Communication Mathematics and Computer Science Biology Biochemistry, Biophysics and Biotechnology Geography and Geology

The new campus and the University Hospital – the most recent buildings	Chemistry Physics, Astronomy and Applied Computer Science Medicine (most classes)

Source: own analysis

The oldest buildings date back to the year 1400. One of them, Collegium Maius, houses the Jagiellonian University Museum, which is a popular venue for many tourists visiting Krakow. Other historical buildings, such as Collegium Iuridicum, Collegium Broscium, or Collegium Wróblewskiego, are still used for lectures and classes today. Collegium Novum (dating back to the 14th century, completely rebuilt in the 19th century) contains the University authorities' offices, as well as lecture rooms, including the official premises where the most important University ceremonies are held regularly. All of the classes and lecture halls in the historical buildings are well-equipped (computers, projectors, often also a good sound system) but their architecture is the biggest obstacle in introducing still more innovation there. Also, they are sometimes hard to access or even inaccessible for people with disabilities. If such a person wants to get there, they are accompanied, helped, or carried by the reception staff, who are specifically trained to do this.

These buildings have their limitations (e.g. steep and narrow stairs, narrow corridors with additional steps in the places where they cross), which cannot be overcome due to their high historic value. Every change and renovation plan must be consulted with the city authorities, with the department of monument protection. Understandably, then, the permission is only granted for introducing minor modifications, such that does not interfere with the original blueprint. Moreover, renovation works are extremely costly and time-consuming, as it is only possible to use specific materials, similar to the original ones, and the paperwork that is essential to obtain all the permissions takes many months. Installing modern equipment, such as efficient lighting, computers with OHPs, or a high-quality sound system, is a great challenge since it must not interfere with the architecture of the building, and it must look fairly compatible with the old-fashioned interior design – in other words, it should be hidden or efficiently covered-up.

Then again, such historical buildings have many advantages – so much so that some faculties (e.g. History, Law and Administration) have refused to be transferred to the new campus and insisted on staying where they are. The location in the city center, in the heart of the Old Town, is definitely the biggest asset. It adds prestige, but it is also very convenient both for the teachers and for the students. The old buildings have their undeniable charm – as many students point out, they look like the classrooms taken straight from a Harry Potter movie. For the people without disabilities that would inhibit their moving around, the winding stairs leading onto a mezzanine or the cobblestones in the inner garden and along the cloisters look enchanting and they constitute a vital part of the atmosphere of studying there.

The new and therefore most modern and innovative buildings are located in three areas: mostly at the 3rd Campus in Ruczaj district (with 7 faculties and a number of other scientific institutions), plus the Medical College with the new University hospital in Prokocim district, and the Faculty of Philology in the city center, partially renovated and partially constructed anew. In addition, the buildings abandoned by the faculties relocated to Ruczaj have been thoroughly renovated and redesigned, to provide comfortable working conditions for the institutes taking them over

(e.g. the Institute of Education and the Jagiellonian Language Centre that were moved to the building formerly used by the Faculty of Chemistry).

The first concept of creating a new campus was developed in the 1970s (Franaszek 2020: 3). It was implemented much later, in 1994, when the University began purchasing the plots of land in this area, and the Krakow City Council made a resolution on the allocation of land in this area for the Third Campus. In 1997, the Krakow voivode together with the authorities of the JU applied to the government for the establishment of a special economic zone in Krakow in the form of a science and technology park. In 1998, the foundation stone was laid for the investment piloting the construction of the Campus, namely, the Centre for Natural Research. Funds were obtained from the national budget, and plans were made to complete the investment by the year 2010. Both the budget and the schedule had to be modified, and eventually, the construction works on the Campus were finished in the year 2017, with obtaining the permission to use the Faculty of Chemistry.

The faculties seated in the earliest buildings of the Third Campus differ greatly from the ones opened only recently. The buildings that were constructed 15-20 years ago were mostly designed and erected based on outdated technology and technical solutions from the 1990s. They look modern but there are certain problems with the design that are hard to overcome. For example, there are long corridors that are too narrow to be arranged in an interesting and meaningful way, as that would be a violation of the fire safety code. However, as the buildings are still fairly new, they are not up for any general renovation works. Minor modifications are done, such as refurbishing the classrooms with movable chairs and tables in the place of the ones fixed to the floor, fixing new 'night and day' blinds in the windows that enable using the projector and the screen even in harsh sunlight, furnishing the corners of the halls with disused tables and chairs removed from the classrooms, or installing the solar panels and more bicycle racks right next to the entrances.

The location is the biggest problem for many buildings at the new campus, especially the older ones. The urban development plan for the Ruczaj area allowed for the construction of up to three floors above the ground. In addition, the area is mostly wetland, with numerous underground watercourses. Due to the restrictions in building both upwards and outwards, the edifices had to be sunken one floor below the ground, which now results in their occasional flooding. The situation of the Faculty of Management and Social Communication is the most complicated in this respect because it is located at the low end of the campus, with a large parking lot of a supermarket nearby located higher and slanted in its direction. Therefore, every heavy rain is potentially hazardous, whereas every torrential rain may result in flooding the underground floor of the Faculty, where the Faculty's servers are kept.

As Konior and Pokojska (2020) observe, the Third Campus is difficult to categorize location-wise: on the one hand, it is a campus edging the city, since Ruczaj is a peripheral district, but on the other hand, it can be classified as located in the city, thanks to its convenient connection to the city center by trams and buses, and due to the fact that the physical distance from the city center is only about 4 km. To some extent, it is still under construction, as the infrastructure is still being built or improved. The architecture of all the buildings is visually consistent and aesthetically pleasing, as they all look modern and are surrounded by well-developed green spaces. The buildings were designed keeping in mind the special needs of the students of the faculty seated

there. Not only are the rooms well-equipped with innovative technical solutions (e.g. screens, sound system, computers, projectors, automatic blinds, automatic light, etc.), but also there were special places designed to meet the needs of the teachers and students of a given institute: a number of laboratories, a TV studio, a radio studio. The buildings are spacious, with partially glass walls and ecological solutions, such as the solar panels installed on their roofs or walls. They are all connected by roads, cycle lanes, and pavements, and they are all easily accessible for people with disabilities. Additionally, the external décor refers to the field of study, for example, there is a large model of the atom in front of the Faculty of Physics, a picture of ants on the Center for Natural Research, and a colorful and highly photogenic inscription "CU@JU" (Illustration 1), often photographed by students, in front of the Faculty of Management and Social Communication. The letters are changed, rearranged, and recolored to fit the situation: in Intellectual Output 1 a different picture was given (JU 4U); the new letters reflect the importance of meeting face-to-face again, after the lockdown.

Illustration 1

Source: https://facebook.com/jagiellonian.university

The design and the construction of a new Medical Campus is a consequence of long-term development of the JU, aimed at the maximum integration of the basic, preclinical, and clinical sciences, the integration of the education of various medical professions, and introducing the latest scientific achievements and trends into the education process of medical students and graduates. It provides an opportunity for better training of modern medical staff using the synergy effect of the faculties in one location with the University hospitals.

Even though the construction of the University hospital integrated with the Medical College didactic buildings was planned since 1959, it took many years to complete. In 1965, the University Children's Hospital was opened, the construction of which was initiated by the Polish Diaspora in the USA, supported by funds from the American government. The dormitories were constructed in the late 1970s, and the Medical College's library was opened in 1984. The new University Hospital was planned all along with these investments, but it was finally opened in March 2019, with some further developments of the College didactic base and the laboratories planned to be completed by 2024. It was designed so that its facilities could fulfill several strategic functions: diagnostic, curative, didactic, and scientific. It comprises 925 beds (including 24 beds in the emergency department), 24 operation rooms (including 2 hybrid rooms, where

online cooperation of other specialists is possible), 27 specialist clinics, and the didactic-administrative building with large lecture halls and smaller classrooms.

The University L&T spaces also include interdepartmental institutions, open for all students and teachers regardless of their mother faculty: the Jagiellonian Library, Auditorium Maximum, as well as highly specialized spaces designed mainly for the use of the University's scientists, but open for wider cooperation, such as the National Synchrotron Radiation Centre Solaris, the Astronomical Observatory, or the Jagiellonian Centre of Innovation.

Auditorium Maximum is a modern conference and teaching facility that opened in 2005. It is located in close proximity to the city center and most hotels. It features a number of rooms of varying sizes and functionalities, from a large hall able to seat 1200 people, through smaller halls and exhibition rooms seating 100-280 people, to a seminar room for 80 people (classroom-style seating) or 60 people (horseshoe-style seating). All the rooms are equipped with a good sound system, a projector, computer, and one or more screens. Large rooms can be divided into smaller ones by a movable wall. It is used by the University mostly for celebrations, holding large exams, or special events (conferences, faculty meetings). More often, though, the spaces are rented to external subjects for lectures, concerts, or conferences.

The Jagiellonian Library together with the Medical College Library and the departmental and institutional libraries make up the library-information system of the Jagiellonian University. Thanks to its extensive collection of Polish publications, it is known as a national library. Currently, the Library processes and archives all Polish publications printed in Poland and abroad. The Library also collects foreign scholarly literature in fields that relate to the University's areas of research and coursework. Priorities include cultural studies, linguistics, literary studies, art, and religious studies. All the Polish publications and valuable foreign items constitute a National Library Archive, and are therefore under extra protection. There are 10 spacious reading rooms there, including the audiovisual reading room, separate rooms for reading manuscripts, early publications, rare publications and ephemera, and graphic and cartographic collections. Moreover, there is a large digital library, providing access to worldwide databases such as EBSCO, Web Of Science, BREPOLiS, and others.

The Jagiellonian Centre of Innovation was established in 2004 by the Jagiellonian University with a view to developing and managing the infrastructure of the Life Science Park in Ruczaj (in the vicinity of the Third Campus), as well as providing a wide range of services to entrepreneurs and scientists engaged in life sciences. At first, it primarily offered such services as laboratory space rental, project grant management as well as providing funding for businesses within the framework of the JCI Venture fund. Since 2013 JCI has been steadily expanding its service offering to include, amongst others, contract research carried out in JCI's owned laboratories and clinical trials conducted there, including the cosmetics industry with cosmetics formulation and production.

The Astronomical Observatory is an Institute within the Faculty of Physics, Astronomy, and Applied Computer Science, based at Fort Skala, some 10 km (6 miles) west of the center of the city. Currently, there are about 40 scientists, actively carrying out research in the following fields: cometary physics, photometry, and modeling of variable stars, the observation of radio emission from the Sun, extragalactic radio sources, active galactic nuclei, the interstellar and intergalactic

medium, galactic physics, magnetic fields in the Universe and the large-scale structure of the Universe. The research is often in cooperation with a number of other institutions both in Poland and abroad, using a wide range of instruments and satellite observations.

SOLARIS is a Polish national research center providing scientists with synchrotron radiation. The Centre has been opened for users since 2018, but it is still growing and expanding its activity to encompass a larger scientific field. is open for all interested scientists, both from Poland and abroad. The access to the infrastructure is free of charge. The center is located on the Campus and it neighbors the Kraków Technology Park special economic zone. The investment was co-financed by the European Union with funds from the European Regional Development Fund, as part of the Innovative Economy Operational Programme for 2007-2013.

The University also has a number of platforms suitable for online use, as listed in section 4.1. They can be used both for asynchronous learning and teaching and for organizing lectures and classes in real-time. They were available before the pandemic, but they were not so popular then, with a large number of teachers not well-acquainted with their functionalities at all. There are two teams administering them and offering technical support and/or trouble-shooting: CZN for the Moodle-type platforms and the IT Centre (DUI - https://dui.uj.edu.pl/start) for all the other platforms and additional software that can be downloaded under licenses purchased by the University.

Pegaz, Jaszczur and Krakus are Moodle platforms. Pegaz (www.pegaz.uj.edu.pl) is the most widespread one, as it is inherently linked to USOSweb (the University Studies Management System) – in other words, once a course is entered into the USOSweb schedule, it automatically appears on Pegaz, and the students can access it easily using a direct link from USOSweb to Pegaz. Therefore, students wishing to take part in a course published on Pegaz do not need to enroll for it, as it is automatically displayed in their timetable, and the teacher has a full list of the group. It is also connected with the University email: a message sent via Pegaz will be shown in the inbox on par with the messages sent from the standard email.

Pegaz was the recommended platform for online tests and exams during the lockdown. Additionally, it is connected with Big Blue Button, and as such, it does not require any further registration or login before the online meeting. Pegaz can be used as a repository for textual and (audio)visual materials, which can be physically uploaded or only linked to some resources available on the internet. It can also be fully interactive, as it is possible to open a quiz, a workshop, a wiki, a questionnaire, or a forum in which students can – and should – participate. The interactive tasks are intuitive to use by the teacher, as they have in-built templates for a variety of tasks (e.g. matching, multiple-choice, gaps, cloze, T/F, open-ended questions, mathematical calculations, etc.). The settings for each task can be changed to fit the needs of the course, for example, there can be a deadline imposed or a limited number of attempts can be established. Generally speaking, many of the tasks are self-testing (the answer key must be determined beforehand, though), yet each task can be additionally marked manually by the teacher, who can thus accept correct answers that were not included in the answer key.

Krakus (www.krakus.czn.uj.edu.pl) is a Moodle platform containing additional courses, not included in the USOS system, open for the University students as well as for the students from other universities cooperating with the JU. The courses are interactive and available at any time,

as there are no deadlines set on them. Moreover, it offers additional working space for the teachers, who can create quizzes there and then copy them onto Pegaz multiple times, for different groups, only changing the task settings accordingly. Additionally, creating interactive materials on Krakus helps to avoid glitches that are common in the case of copying quizzes between various groups on Pegaz many times.

Jaszczur (www.jaszczur.czn.uj.edu.pl), in turn, is a Moodle platform for the University employees, dedicated mostly to conducting courses and workshops online (e.g. OHS – the Health and Safety procedures). Since a course there may include both study materials and quizzes checking the participant's knowledge of the subject, it is well suited for the purpose of the cyclical obligatory workshops such as the one mentioned above. All three platforms work using the same operational system (Moodle), which enables easy transfer of materials between them.

Before March 2020, all of the abovementioned Moodle platforms were used for different forms of e-learning by some institutes, either the ones where remote learning comprised a part of the regular course or as a substitution of a regular class in case the teacher was on sick leave. For instance, in the Jagiellonian Language Centre, Jaszczur served as a repository of ready-to-use online classes for substitutions. The lessons were prepared by a team of substituting teachers and they encompassed a variety of topics, from highly specialized ones (e.g. biotechnology, geology, mathematics) to more general ones, such as the history of chocolate, or the problem of procrastination. If a teacher called in sick, a substitute teacher took over their group on Pegaz for a week and ascribed the ready sets of tasks, copied from Jaszczur. This way, no classes were canceled, as groups had a chance to make up for the lost face-to-face meetings by working online under the supervision of another teacher.

A few years ago the Jagiellonian University purchased a license to use Office 365, which has been the main tool both for teachers and for students since then. It is a well-known set of applications designed and powered by Microsoft, which allows storing, sharing, and co-creating documents in a variety of formats, for example, Word, Excel, Forms, PowerPoint, to name just the most popular ones. Using the applications it is easy to share and co-create documents with people from the university (students, teachers, other staff) and from the outside while maintaining control over who can access and change them. It is particularly convenient in the case of e-learning, where it becomes the main instrument for online communication, but it is also widely used in courses with face-to-face meetings, where it complements the regular materials and tools.

MS Teams is one of the abovementioned applications, used for holding online classes with students or online meetings with other teachers. For the duration of remote learning, it was one of the two main platforms for synchronous teaching. It was also the most popular one both with teachers and with students, for a number of reasons, including its connection with the other applications in Office 365, its intuitive interface, the multitude of built-in functions (breakout rooms, sharing a screen, raising your 'virtual hand', the possibility of attaching emoticons or files on chat). With MS Teams it is possible to hold large meetings (e.g. lectures) where everyone can have their webcam on or off without breaking the connection, and everyone can participate in chat. Moreover, the application can be used on one's smartphone, which means more freedom to join a meeting from any place, at home, or 'on the go'. However, Teams requires a good

internet connection, lest the transmission is easily broken, and it is not fully compatible with Mac, which means that the people using that brand of laptops may face difficulties using some of the functionalities.

Big Blue Button is another available University platform for holding classes, lectures, and meetings online in real-time. It is linked to Pegaz, and to USOSweb by extension, but it is less popular. It has similar functionalities as MS Teams and it has similar advantages. Moreover, the teacher does need to open a new group or compile a list of students, as it is all done automatically, with all the necessary data imported from USOS. However, it seems to be more outdated (students often call the interface “old-fashioned” or even “awkward”), there are smaller limits of people who can participate in a meeting and it tends to overload more easily.

All of the abovementioned online spaces were regularly used during the lockdown, but they are still used after the restoration of regular classes, although for a different purpose. Each teacher had their preferences, using MS Teams or Big Blue Button for synchronous meetings, and MS Forms or Pegaz for asynchronous ones, but the experience of teaching online has resulted in quick development of tools and ideas for blended and hybrid learning and teaching that are in place now. It also led to greater flexibility of all the parties to use a variety of methods and to implement them interchangeably, which proves to be beneficial for the learning and teaching process.

5. Stakeholders' perceptions on the design, implementation, and use of L&T spaces in the Jagiellonian University

The interviews carried out with individuals or groups of representatives of the main stakeholder groups have yielded interesting results. The existing and the planned/required spaces are perceived differently by different groups of respondents, which may follow from their more or less in-depth knowledge of the situation, as well as their different needs and expectations. The differences are also perceptible between faculties, due to the disparity in their furnishing and equipment.

5.1 Institutional top managers

The interview with the Vice-Rector responsible for the Didactics was mostly focused on the existing solutions implemented at the Jagiellonian University, as well as the infrastructure necessary for this purpose. The Vice-Rector emphasizes the fact that as a research university, the JU aims to provide very good opportunities to study and conduct research, which is instrumental in the future development of the University and the region. The freedom of research and education, together with honesty and responsibility in this area, is the essential condition to gain the highest quality which the JU strives for. Being a part of the region and closely cooperating with other stakeholders, not directly connected with the University, entails a certain synergy of the activities and planning them in collaboration with other partners, at least to some extent. Furthermore, scientific excellence, based on conducting the highest quality research, including interdisciplinary and international work, and using modern technologies, requires state-of-the-art learning and teaching spaces, both physical and digital ones.

It has been strongly emphasized that the main assumption of the University is providing access to research and learning, which translates into the appropriate design and organization of all the spaces. The need to adapt the L&T process to the changing conditions, oscillating between stationary and remote education only to result in hybrid and blended learning and teaching after the end of lockdown, calls for finding new solutions that would enable the harmonization of the L&T process regardless of the methods and spaces used to implement them. The University managers are in the process of making science and research more flexible while ensuring high-quality education and room for innovation. Additionally, a great emphasis is placed on the availability of physical and digital infrastructure for people with special needs.

The future development of the University is impossible without the appropriate modernization of the available spaces and their adaptation to the current needs, as well as creating new ways of effective knowledge transfer. It gained importance, especially at the time of the outbreak of COVID-19 when the University was forced to adapt all the activity to the new conditions almost overnight. Back then, new technologies were dynamically incorporated, and it seems they are all bound to stay within the education process much beyond the duration of the pandemic. Presumably, at present all the activities such as promoting, supporting, and conducting research and education are impossible without the use of virtual or hybrid spaces complementing the traditional physical spaces. Their coexistence appears to be the essential condition for the proper implementation of the modern approach to science and education. In this regard, the University focuses not only on activating mechanisms of sharing infrastructure within the JU but

also supports processes aimed at the consistent use of available spaces in order to modernize education. Combining traditional and innovative spaces seems to be inevitable in the dynamic development of any HEI nowadays.

The University has an extensive infrastructure system that allows the use of all of the abovementioned spaces in the process of L&T and conducting research. There are state-of-the-art teaching facilities (classrooms, lecture halls, laboratories, and other research facilities), as well as modern software and licensed digital products enabling the creation and use of virtual spaces. In addition, many applications are flexible enough to facilitate blended and hybrid learning and teaching, both synchronous and asynchronous. Such implementation and combination of all the available spaces is a determinant of progress in improving the education methods.

The need to create new L&T spaces is motivated by the desire to make L&T methods more flexible in the face of the ongoing technological revolution. For many years, the University has been undertaking activities aimed at computerization of the education process, both in terms of the administrative support and of the L&T methods themselves. The main goal of such changes is the evolution of the JU towards a modern research university which is not indifferent to the changes happening in its environment. Various forms of distance L&T are dynamically developed, hence the virtual spaces are the dominant form of innovative spaces. These methods are promoted and supported by the Distance L&T Centre (CZN) and the IT Centre (DUI). Moreover, additional support for the education process can be found on the Open Educational Resources platform, which contains materials available for anyone willing to use them.

These spaces are used for all the stages of education, both for lectures/classes and examinations, including diploma exams. They serve university employees and students alike, and the assessment of their impact on the education process is verified in a biannual online survey.

The Vice-Rector has identified the need to conduct more workshops to enable all the teachers and lecturers to make still fuller use of all the virtual spaces available at the University. Short IT courses and training, as well as the observation and discussion of good practices successfully implemented by others, seems to be the best solution at that stage.

5.2 Directors of schools and/or departments

Directors of schools and/or departments are not a uniform group of respondents, as their perspective depends to a large extent on the Faculty or the Institute which they represent. Therefore, interviews were conducted among Deans and Directors of Studies in various fields, in order to better reflect their different situations, as well as different needs and expectations. The main aim of such an approach was to show the inherent duality of the University, which is a long-standing institution, one of the oldest HEIs in Europe on the one hand, and an innovative place open to innovation and internationalization on the other. Tradition and modernity meet in the juxtaposition of the Faculty of Law and Administration and the Faculty of Chemistry, with the additional perspective of the newly-established Doctoral Schools, uniting students and teachers from different fields and thus combining various interests.

All respondents agree that the University emphasizes the freedom of education, including the diversity of solutions, innovation, interdisciplinarity, and internationalization. Another common element that is strongly underlined is honesty, understood as transparency, reliability, and ethics. Continuous improvement is also important, seen as striving to consolidate high-quality teaching practices, developing and enhancing teaching methods, promoting education based on an individual approach to a student, and respecting the dignity of others.

In more practical terms, all respondents emphasize the need to organize interactive classes, aimed at the development of transversal competencies, improvement of teaching methods, with classes taught by practitioners experienced in their field, while transferring some activities (especially lectures) online, to enable self-education and higher student autonomy. On research faculties, such as Chemistry, it is also of utmost importance that research is linked with didactics, and students of all levels are included in it and can actively participate in it. In addition, doctoral students can do research under the supervision of their tutors and then co-author papers published in renowned international scientific journals.

The University provides appropriate spaces, both physical and virtual ones. There are well-equipped classrooms, computer labs, and quiet workplaces for students; technical support is also offered. Physical spaces in new buildings were specifically designed in such a way that they are comfortable for students, and their equipment and furnishing allow for the configuration that is adequate to the classes conducted. New spaces are constantly modernized to meet the changing needs of students. The constant improvement of the technical facilities of the teaching spaces is a priority, aiming to ensure greater comfort for both teachers and students (new desktops, seats, multimedia projectors) and to make hybrid L&T possible (new software and hardware). Among the changes that are gradually introduced in classrooms and lecture halls, there are an adequate number of USB and electric sockets, efficient ventilation, movable boards, stable Wi-Fi access, and adjustable lighting intensity.

However, as one of the respondents points out, the University's policy in designing new or renovating old spaces is rather unclear to other subjects, and the opinion of the department that is supposed to occupy the space afterwards is not fully considered. For example, before the construction works began, the Dean was asked about the sizes of the classrooms and some general information concerning the planned use of the spaces. He also suggested separating the administrative and didactic spaces more clearly, which was not taken into account and has not been implemented in the building. In addition, some furnishing errors can sometimes be observed, too, like equipping some classrooms with chairs that have in-built tables. Convenient as they seem to be thanks to their flexibility (it is very easy to rearrange the classroom then), they are useless for the left-handed, who cannot possibly use them comfortably.

Virtual spaces are of particular importance, given the circumstances. In faculties where online L&T constitutes a large part of the curriculum, such as the Faculty of Law and Administration, the development of such spaces is one of the main concerns. It results in the introduction of a greater variety of forms of education and the use of distance learning opportunities. The project of e-textbooks at the Faculty of Law and Administration, co-financed by the ZintegrUJ program, may reform online learning and teaching. Active e-textbooks make it possible for a lecture to be delivered using a dedicated internet platform. The course is divided into modules containing

authorized recordings (with subtitles and explanations), teaching materials, and questions with which students can test themselves. On the other hand, a passive e-textbook available online at all times can be an element of compulsory or additional literature, and a way to expand knowledge outside the program of studies. In general, the idea of e-textbooks is in line with the trend of creating the University of the Future. Introducing e-textbooks instead of some lectures would make better use of the students' time, since they could be present for the actual discussions, problem-solving, etc., instead of passive one-sided transfer of knowledge.

New approaches to learning and teaching clearly follow from the points discussed above, but they are hard to define. Some respondents understand them as activating students in class (physical or virtual) while reducing the amount of ready-made knowledge provided by the teacher. Other respondents, though, connect modern approaches with such an arrangement of space that will enable maximum flexibility of the equipment and will link the space with the content of the class (which is of particular importance, especially during workshops and simulations). The equipment used must be intuitive, with all the functions activated in a simple way, preferably with one button. Introducing a uniform system for all the lectures and classes would be profitable for all sides. As hybrid classes are bound to become a new reality soon, it is crucial to prepare the physical spaces for them, for example by installing cameras that would automatically follow the speaker even as they move around the classroom.

Physical spaces, complete with the equipment appropriate for the field of study and the character of lecture/class, are to be found at all faculties. Laboratory classes, indispensable at research faculties (Chemistry, Physics, Biology, Biotechnology, Geography, etc.), are conducted in well-equipped state-of-the-art labs whose installations meet all the standards of occupational health and safety. In most cases, laboratories are located in a separate wing or part of the building to ensure maximum comfort and convenience for the young researchers. Lecture halls in larger faculties (such as Law and Administration, with several hundred students in one year) can be divided into smaller ones, depending on the size of the group. Additionally, some rooms have been designed specifically to meet the requirements of the curriculum, for example, the courtroom for moot courts in the new didactic building of the Faculty of Law and Administration, or the room for forensic classes in another building of the same faculty.

As far as possible, classes are conducted in buildings where adaptations can be made for people with special needs, in particular people with disabilities. There are adequate lifts and information signs in Polish and in Braille. There are designated places for people with disabilities in lecture halls. Some halls (e.g. the one at the Faculty of Law and Administration) are also equipped with special lifts enabling disabled lecturers to access the desk.

Common spaces for students are organized, although they need to be modernized at some faculties. The Faculty of Chemistry sets an example in this respect, as there are many such spaces, including the ones where students can relax in a friendly atmosphere, as well as the quiet workspaces equipped with tables, comfortable chairs, and writing boards. Students also have the opportunity to use a canteen, separate for each faculty (the one at the Faculty of Chemistry is furnished with deckchairs, and students can access a rooftop garden and relax there). Moreover, there is a library at each faculty, with a designated quiet working space complete with a computer or a desk with an electric socket and Wi-Fi access.

New programs supporting education appear in virtual space, some addressed to all students, while others are offered at the faculty level. Alongside them, programs for teaching staff are offered, where teachers can learn new didactic methods, discuss the existing ones and improve their skills in general.

All the new and innovative L&T spaces at the University have been introduced to increase the quality of the education process and to enhance it with more attractive elements. New technologies enable greater flexibility of classes and lectures: the ones that would have to be canceled or postponed due to unexpected circumstances can be conducted according to schedule but in a modified form. Some solutions stem from earlier projects, for example, the room for hybrid L&T at the Faculty of Law and Administration is a direct result of the "Małopolska Education Cloud" project, originally connecting universities with high schools and now used to conduct classes with foreign teachers who cannot come to Krakow but can do remote teaching this way.

The comfort of teachers and students is another important factor taken into account when designing new spaces or renovating old ones. The reception of the University both by Polish and by foreign students is more positive in such spaces. Additionally, the aim was to make students feel at home, to make their time in between classes both effective and comfortable. Spaces for quiet independent and group work can integrate them better and they let them practice soft skills in a peer group.

All of the abovementioned spaces and tools can be used to organize traditional, hybrid, blended or online classes, and to pass free time either more productively, or in a truly relaxing way. There is no formal assessment of their impact on the L&T process yet, but preliminary conclusions can be drawn from individual interviews with students or on the basis of in-depth analysis of the biannual survey conducted online at the university level.

When asked about additional needs for creating new spaces or for improving the existing ones, the respondents pointed to the need to create special zones for students (and for employees) in every faculty, where they could relax between classes or do quiet work using their own electronic devices. Such a place could integrate the academic community and it would greatly enhance the time they spend in the building, waiting for classes or lectures. To achieve that aim, it is necessary to purchase the right furniture, as well as to equip the spots adequately (electric sockets, USB sockets, Wi-Fi access, good lighting).

5.3 Teaching staff

The teachers who were interviewed are well aware of the innovative learning and teaching methods, and they are trying to modify the existing spaces so that they best suit their needs. Implementing such innovative methods is essential, since they not only develop strategic thinking, flexibility and creativity, but they also help to apply theoretical knowledge in practice. They allow to link various areas and inspire to look for solutions in different fields of science. It results in a comprehensive approach to education and student development.

The role of space in the process of learning and teaching is one of the key factors supporting and organizing this process. It has a decisive impact on its efficiency and effectiveness, as it

contributes to building a climate of openness, cooperation, and creativity. In the well-equipped classrooms (i.e. the ones with multimedia, the screen, good speakers, plus cork-boards on the walls which students can use for example while working on team projects), learning and teaching are much more effective. However, there are still many spaces which are definitely underdeveloped, for example, the large empty halls and corridors that have great potential but hardly any practical solutions are introduced there. Most of the respondents noticed that if the space is rearranged (smaller classrooms are furnished with chairs and tables that can easily be moved around), it arouses interest in the group and enhances the L&T process, as it prevents routine or boredom. Therefore, the general opinion was that such spaces are desirable.

The pandemic has proven that the L&T space should be multi-dimensional. The traditional classroom is still the basis in many cases, but hybrid solutions should complement it not only during the periods of pending lockdown but also permanently. Hybrid or virtual spaces allow to introduce more variety into learning and teaching, as well as provide more varied resources, including many interactive ones. Distance learning and teaching have enriched the quality of education at the University because, despite all the shortcomings, we have all crossed a certain border. Even though some respondents were less keen on virtual spaces, given the technical problems and the size of the groups they work with, everyone agreed that certain permanent changes are inevitable, therefore such discussions are necessary.

Bearing in mind the conditions for the implementation of the didactic process in the past (problems with the availability of the classrooms, lack of equipment, unstable Internet connection), the current situation can be assessed as satisfactory. However, in the context of the modern model of learning and teaching, spacious lecture halls with a rigid arrangement of seats are insufficient and it leaves much room for improvement. Also, the shared spaces are a serious drawback in some faculties, most importantly at the Faculty of Management and Social Communication, which is the biggest one at the JU. The only space which is quite well used is the Institute of Culture and its immediate vicinity. There is a large table with chairs for students, there are some places to relax (bean bag chairs), and the walls are covered with murals and with large posters. However, as there are not enough such spaces, the library seems to be the students' favorite spot, as they have access to digital and analog materials there, but they can also work together and ask for help if they need some explanation.

In general, there is a great need to share knowledge among students. They mostly use virtual platforms for this reason, such as Office 365, but they often complain that there is no uniform platform, which means they have to adapt to the requirements imposed by the teacher. MS Teams seems to be the optimal solution, generally praised by the teachers interviewed because of its flexibility, intuitive interface, as well as the fact that it is so closely connected with a number of applications. Many respondents use Pegaz, too, which seems to be an excellent repository for the didactic resources – available for the students at any time, but also safe from any (inadvertent) modification or even deleting by the students.

There is definitely not enough space for independent learning between classes at most faculties. There is a lot of empty space in the corridors but it is not used properly. There should be both small workstations, able to sit 1 or 2 people, and large ones for team projects (6-10 people), well-lit and equipped with large tables, comfortable chairs, stable wi-fi, and electric sockets. In

general, the corridors should be more student-friendly, giving the opportunity to rest and relax while waiting for the next class. Electric sockets are missing from classrooms, as well – there are so few of them that usually students cannot work using their own laptops. Moreover, there is a problem with the rooms for specific purposes. The moot court is an example of good practices, yet the situation is different at other faculties, where such specific rooms (e.g. the room for focus group interviews) are used as regular classrooms, hence they are usually occupied by groups which do not use them as intended.

As for hybrid/blended learning, the existing platforms, which were well-tested for the three semesters of distance learning and teaching, are sufficient to satisfy the basic course needs. Equipping the classrooms with cameras and an efficient sound system would enable conducting real hybrid classes – right now, it is impossible for the teacher to focus on the students present in class and the ones participating online at the same time, or to give both groups the same amount of attention and support. Some teachers also pointed to the need to introduce better solutions for remote examinations, which would allow the examiner to control the student's behavior more closely.

When asked about the support necessary to take better advantage of the existing spaces, the teachers pointed to more workshops and training which would address specific issues rather than a general overview of a platform or an application. Some also suggested organizing cyclical meetings in the form of round tables or online meetings, where the participants could share best practices, systematize and broaden their knowledge, and popularize modern L&T methods. It could increase their motivation to develop new skills and to look at the L&T process from a new perspective.

5.4 QM staff/pedagogy

The implementation of innovative learning and teaching methods is directly connected with the spaces which are available both for the courses/lectures and for the individual use of the teachers and students. Physical spaces used to be the best solution for traditional teaching. However, this approach changed after the lockdown. There are many well-equipped spaces, well-suited to the needs of various courses. Virtual spaces include a number of platforms, very useful in distance learning and teaching, essential for upkeeping the high quality of education.

Virtual spaces have been designed with modernizing the educational process in mind. There are many advantages, particularly important in the pandemic, such as health benefits following from the lack of direct contact between people, and lower absenteeism following from the high flexibility of the platforms. Also, because of the automatized testing/examining process, test results are available much faster and there is a lower risk of errors in calculations.

The existing physical and virtual spaces seem to be sufficient for the purposes of the L&T process. There are a number of workshops and trainings organized (e.g. ZintegrUJ), which helps the teachers fully use the functionalities of the spaces. It would be advisable to organize conferences to see how similar spaces are used at different universities. Such a benchmarking procedure could be beneficial in finding new solutions and in optimizing the existing spaces.

5.5 Students

Even though all the students emphasized that they do not feel experts in the field of modern L&T methods, they feel intuitively that the properly developed and comfortable space is of utmost importance. In well-kept and well-equipped spaces, adequate to the needs of young people, motivation grows, and people want to spend their free time there.

Students do not have a high opinion of the virtual spaces or distance learning and teaching, though. They think that reducing the interaction between the teacher and the students is not conducive to the acquisition of knowledge, as it dismantles the uniform space for L&T and it substitutes it with a variety of platforms, which is rather distracting. They do not consider education during the lockdown more modern than before it; rather, it was the only way to learn. The efficiency depended to a large extent on the individual conditions that each student had at home: the quality of their hardware, the internet connection, the physical space at home that would be isolated enough to provide some privacy. In addition, they have pointed out that some of the best virtual spaces for sharing notes and exchanging knowledge were actually created by the students themselves, without any involvement on the side of the teacher.

In general, the existing spaces at the JU are very diverse depending on the faculty. Those located at the campus are usually more modern and their infrastructure is better adapted to the needs of students. The faculties located in the historical buildings in the city center are not as well adjusted to the new standards.

The students' opinions differed in many points depending on their affiliation. Chemistry students find the conditions at their faculty excellent. The physical spaces are well developed: the classrooms, lecture halls, and labs are well-equipped and they meet the standards of modern approaches. The common spaces are well designed and they are great for both learning and relaxing. In addition, there are a few places for distance learning designated in the library (in soundproof boxes with computers), which makes hybrid education possible regardless of the schedule, as students do not need to return home for the online classes.

On the other hand, students from the Faculty of Management and Social Communication, as well as from the Faculty of Philology, see the need to improve the common spaces. Study spaces there are to be found only in the library, but since one must keep quiet there, it is not conducive to teamwork or exchange of opinions. There are some desks in the corridors, frequently occupied by students, but they seem to be a random collection of disused furniture from some classrooms. Besides, there are no electric sockets next to these tables, which makes working there difficult. The same problem can be noticed in classrooms and lecture halls, too – there are two sockets in classrooms, a few in large lecture halls, which is definitely not enough if more students want to take notes on their laptops. The sofas next to the reception desk in the main hall are comfortable and extremely popular, but their arrangement in rows inhibits free communication, and their placement in such a spot is not a good solution, either, because of the noise and the general commotion there.

These students also feel there is a need to create some common areas to sit and relax and to spend time between classes in a lazy or productive way. The ideal place should be arranged somewhere away from the main passages, which would ensure some peace and quiet, but also

some intimacy so that people can talk freely without being stared at or listened to. It should be equipped with tables and comfortable chairs in some, and with poufs in others so that everyone can find the perfect spot to suit their needs. These spaces should be at least partially covered with plants or a screen and they should be equipped with electric sockets, phone chargers, and a stable wi-fi connection.

Another important point raised by all the students is the need to arrange a space (a separate room or even a dead-end of a corridor) that would be equipped with a kettle and a microwave oven, as well as large tables and seats. It would enable students to eat the hot lunch they brought from home. Even though there are very good canteens at the faculties, they are crowded at lunchtime, so the 15-minute break turns out to be insufficient to wait in a long queue and then eat the meal. Moreover, some students follow special diets which are not so easily found in the canteens, hence a well-designed kitchen/dining space would be really helpful for them.

At the same time, the location of both Faculties makes it almost impossible to look for another place to have lunch: good restaurants that would be within the students' budget are mostly located in the Old Town or in Kazimierz district, and the break between classes is usually too short to travel to and from such a venue.

Students from the Faculty of History support many of the claims put forward by their colleagues described above since the medieval buildings have their obvious limitations and shortcomings. They also complain about the actual lack of history in the common spaces and on their outdated quality. Many raised a suggestion that the walls should be repainted, as their color is rather sickly now, and they should be decorated with something pointing to the institute seated there, e.g. historical maps or old photographs in History, some cultural references in Ethnography, etc. Moreover, they emphasized the fact that most areas are practically inaccessible to people with disabilities – the stairs are steep, the staircases and corridors very narrow, and the lift is usually out of order.

However, they also appreciate the beauty of the architecture and the charm of many of the spaces. They have all the necessary equipment in the classrooms, and it is mostly the halls and corridors that need some reworking. In addition, as they study history, archaeology, ethnology, or art history, they do appreciate the location of their institutes in such historical buildings of great cultural value. They also appreciate the fact that the Faculty is seated in the center of Krakow, which means that they have everything they need (such as restaurants, dormitories, museums, and other places of culture) at their fingertips.

5.6 Non-teaching staff directly involved with L&T

The respondents in this group do not feel competent enough to discuss innovative L&T methods, but they feel that there must be a direct connection between them and the arrangement of spaces. Physical spaces seem to be a weakness in this respect. Designed at the beginning of the 21st century, they have been prepared specifically for the traditional educational methods, with the teacher talking and the students mostly listening. A fixed projector and the screen, and the general arrangement of the classroom, with fixed bolted chairs and the teacher's desk, facilitate

this kind of a lesson, but they are a serious obstacle in the implementation of more innovative ideas that would involve moving the furniture around.

As far as the virtual spaces are concerned, there is a wide range of tools available, such as MS Teams, Pegaz, Blackboard, and others. There are additional tools (for example electronic pens, tablets), which offer new opportunities to improve the quality of online education. The change in the method of teaching from the traditional classroom to online classes also affects the teachers, who get acquainted with new approaches and learn to vary the materials and adapt the lecture content to the most relevant issues.

Hybrid learning understood as a combination of the two methods described above has been forced by the pandemic. Theoretically, it opens up new perspectives and enhances the quality of learning and teaching in the long run. In practice, though, in many cases, it is simply a direct transfer of the lecture or class into the online environment, and the traditional methods of teaching are copied into the new medium. What is more, students do not seem to be ready to embrace online or hybrid education, as they tend to be inactive, using technical problems as an excuse. They do not take advantage of the opportunity of self-development, and they expect the traditional enforcement methods instead.

At the Faculty of Management, there is no space for individual or collaborative work between classes, or for relaxing. If well-arranged, such an informal space would offer a great opportunity for the students to create stronger bonds with the University, as it would encourage them to spend more time there. At present, the Faculty participates in the “Creative Cooperation Space” project, which is a part of the Excellence Initiative strategic program at the Jagiellonian University. It involves the creation of a workshop room using the design thinking method. The room will not be used as another classroom, but rather as a space for the cooperation of students, teachers, other staff, and external stakeholders.

5.7 HEI estate staff

In the opinion of the estate technical support staff, didactic spaces are modern and well-designed. The spacious lecture halls with their good sound system are a great advantage, as they allow for conducting both face-to-face and online classes in an effective way. There is the necessary equipment for online streaming (cameras, microphones) but there are no rooms dedicated to hybrid learning, i.e. the ones that would have all the facilities for conducting regular classes while streaming (movable cameras and sensitive microphones). Such equipment has been temporarily installed in one lecture hall at the Faculty of International Relations and Political Studies, as a test for its functionalities.

A technical solution which would facilitate work in the classrooms is the so-called ‘one click’, i.e. unifying all the systems in all rooms and configuring them identically so that they were operated in the same way everywhere, without the unnecessary idiosyncrasies. Also, it would be a good idea to install one USB port so that it would be sufficient to connect the laptop in order to start teaching a class. Right now, such an operation is much more complicated, and it requires disconnecting other equipment, differently in different classrooms.

In many cases, there are serious flaws in the design of the building before its general renovation. For example, Wi-Fi is available in all buildings but in many, the signal is not strong enough to reach some areas. As a result, after initial problems with connecting computers to the internet, the network had to be recreated, with new wires and new access points installed.

The common spaces seem to be sufficiently furnished: there are tables and chairs where students can spend time working individually or in groups. However, there are insufficient cloakrooms (usually they are too small to accommodate all the students and the staff) and there is no space provided for storing other belongings, such as suitcases. Another element that would facilitate the work of the estate staff is a little window leading to the outside. This way, some people could ask a question or leave some documents without the necessity of their entering the building, which is particularly important during the pandemic.

The key problem which all the IT support need to face in all the locations is the lack of basic technical knowledge on the side of the teachers. Lecturers often call for help about simple matters that they could easily deal with on their own, for example, a disconnected projector (all it takes is to reconnect the wire). It seems that the teaching staff needs more workshops and training on the most basic level. They are mostly unaware of the hardware capabilities, and they do not know what can be done beyond the simple function(s) that they mastered. It is particularly important at present, in the times when the number of online and hybrid classes is on the rise.

5.8 Architects

The architects that were interviewed for the project are both professionals in this field, and professors at a HEI, which means they have a wider perspective on the topic. They had an opportunity to learn about the latest architectural solutions used in the design of university spaces during their study trips to Canada, Australia, the Netherlands, Austria, France, and Italy. In many respects, the teaching spaces of Polish universities are detached from the practice and solutions used in architecture. In other countries, the newly-designed university buildings are supposed to become landmarks of their hometowns. In Poland, though, nobody considers that, and it is the investor (i.e. the university authorities) who can decide about the final shape of the building. Even in such matters as the building orientation or lighting, it is usually the size of the land and the investor's budget that are decisive. It does not encourage architects to look for innovative solutions.

The two aspects that are clearly lacking in all university buildings are the right equipment for conducting hybrid classes and well-thought-out common spaces that would feel welcoming and would encourage students to spend more time at the University, for instance between classes. In other countries, university cafeterias play such a role. They must be open to all, offer some good coffee and snacks, and provide a cozy atmosphere so that students want to spend their time there and work there, preferably in teams/groups. The proximity of other infrastructure (such as the library, free Wi-Fi access) would be conducive to encouraging self-study as well as some projects done in groups.

5.9 A discussion

The interviews have shown different perspectives on the issue of the existing and the planned space for learning and teaching. In some respects, the opinions are convergent, for example, all the respondents seem to agree that the variety of online platforms offered by the University can meet the needs and expectations of different groups of stakeholders. There is also a general consensus that the University has many innovative physical spaces, such as well-equipped classrooms or laboratories, which are well-suited to the needs of both teachers and students at different Faculties. Together with the well-developed digital structures, they have the potential to greatly enhance the quality of education and promote new approaches to L&T.

The differences between the perceptions of different groups of stakeholders emerge along two axes: depending on the faculty, and to some extent also between the authorities and the teachers and students, who use the spaces on a daily basis and can therefore better observe their drawbacks or shortages.

The Faculty of Chemistry, which is one of the most recent and therefore one of the most modern faculties at the Jagiellonian University, is the leader in well-designed and well-thought-out spaces. The Dean, the staff working there and the students agree that both the L&T spaces and the common spaces in the halls/corridors are adequate for their needs. There is a variety of places to relax and/or to work together or individually between classes. Also, there are soundproof places in the library which can be used for online classes. Hence, the schedule does need to include long breaks for commuting back home, as is the case with many other faculties. The Faculty of Chemistry could therefore be used as a model of innovative spaces, to be emulated by other University units.

Quiet and isolated places for learning seem to be the biggest problem at most faculties. Even though the University authorities mention them as one of the strengths, in fact, they are largely inadequate and underdeveloped. For example, the chairs are often uncomfortable, the furniture is arranged in a way that inhibits free communication, and there are no/not enough electric sockets next to them.

The digital structures, used in distance and in hybrid/blended learning have much improved due to the forced transfer of all the activity online after the outbreak of the pandemic. The teachers learned how to use the new tools really quickly, and they largely embraced the new teaching methods and techniques that followed. As they are ready and willing to implement the new skills and knowledge after the lockdown is over, it is a great improvement of the quality of education. However, the students do not seem to be so keen on the new developments. They envision much of the online L&T as choosing the lesser evil, and they often complain about the chaos that ensues if teachers use different online platforms in their courses, thus forcing the students to look for the materials in various places instead of keeping them in one convenient folder.

6. A strategic SWOT analysis on the design, implementation, and use of L&T spaces in the Jagiellonian University

Strengths	Weaknesses
• New buildings of JU Campus (e.g., New Campus, new teaching facilities at the university hospital) surrounded by extensive green spaces and equipped with outdoor gyms, promenades, and benches of different sizes • All University buildings are well-connected with the city center by public transport • Numerous adaptations for people with disabilities • Extensive use of modern digital teaching platforms and new educational technologies, especially new software programs and applications • Digital assessment of students of all programs • Digitalized administration • Significantly increased students' practical training and work-based learning hours • An increasing number of online libraries for students and staff • The new practices and procedures of internal communication and information exchange after COVID 19	• Old (some medieval) buildings, with lots of physical and legal limitations for modernization • Insufficient digital proficiency of teaching staff • Lack of needs analysis for L&TS (existing and to be constructed) • Lacking or insufficient public spaces for quiet study between classes (at some faculties) • Insufficient access to classrooms by students (they can only enter a classroom when accompanied by a teacher) • Weak design of some classrooms: no windows (hence no daylight), tables fixed to the floor, and impossible to move around - it does not promote didactic innovations • Canteens: at two modernized faculties they are too small to seat all the students during the lunch break; no canteens at some faculties • A food truck court could partly solve the problem of insufficient canteen space at the New Campus - however, it is not even considered yet • Weak Wi-Fi connection in more distant parts of the buildings, an insufficient number of electric sockets
Opportunities	**Threats**
• Growing international cooperation of JU (academic teachers and administrative staff gains knowledge on innovative L&TS abroad) • International exchange of good practices about space arrangement • Gradual enhancement of university space by modernization of old buildings, and improvement of newer ones • A bigger number of events that use the available space (Open Days, the Science Days/Nights, etc.)	• Lack of stable, long-term planning of the government • Insufficient long-term planning and a lack of a coherent long-term vision by the university authorities • Lack of incentives for city-university cooperation in buildings' design • Insufficient inclusion of the stakeholders (especially students) in the process of space design and planning

• Introducing new forms of cooperation/events with the city and with other universities in Krakow • The development of the existing sports and relaxation outdoor spaces already available at the campus	

Own source

The SWOT analysis above is problematic to some extent, as many aspects of the functioning of the university can be considered both as a strength/opportunity and a weakness/threat, depending on the exact location. The new campuses (Ruczaj, Prokocim) are modern, surrounded by green spaces, well-adapted for the needs of people with disabilities. Yet it cannot be said about the old historical buildings in the city center, where these aspects are weaknesses that cannot be rectified because of a number of legal limitations. Conversely, the location of the old buildings in the city center is their definite asset, whereas the location of the Collegium Medicum buildings (30-40 minutes by tram or by bus from the city center) could be seen as their weakness.

Parking areas are sometimes excellent, but they can be problematic, too, depending on the location. The new campuses have large parking spots, with separate places for people with disabilities, and with a sufficient number of regular places for the staff and the students using their own cars. However, elsewhere (mostly in the city center, in the historical buildings as well as in the new ones, such as Auditorium Maximum) the parking lots are insufficient even for all the staff, and the students cannot use them at all.

There is no research into space development that would be coordinated at the university level. There are some projects conducted at individual faculties (e.g. the cooperation of the Faculty of Geography and Geology and the Faculty of Management and Social Communication, mentioned here), but the issue should be approached from a broader perspective, taking into consideration the needs and the limitations of all the various university spaces.

7. Conclusions and recommendations

The Jagiellonian University is so large and diverse that it is hard to draw overall conclusions that would hold true for each and every faculty. In fact, it would probably be more practical to treat each faculty separately and to underline their strengths and weaknesses with reference to their individual needs. The only aspect that connects everyone is the digital spaces, uniform for all teachers and students. Nevertheless, even these spaces can be used more efficiently by the non-research faculties and less so by the ones based on research (such as for example Biology, Biotechnology, Physics, Astronomy, Chemistry, the Medical College), where it is essential that students come to class and draw their own conclusions by working in a laboratory, observing certain phenomena, experimenting, etc.

In general, the University's physical spaces fall into four broad categories:

1. centuries-old, historical buildings (under monument protection laws);
2. decades-old buildings (completely redone, slightly modernized or left unchanged);
3. first buildings at the new campus (already a bit outdated);
4. completely new buildings (designed in compliance with all the new standards).

The faculties located in the Old Town (Law and Administration, Polish Studies, Philosophy, History) are the oldest and the most traditional faculties of the University, and they are all based in centuries-old buildings, which are monuments, protected by law. The buildings are visually stunning, as their architecture is impressive, yet it is extremely difficult to design and implement truly innovative L&T spaces in them, as it would require introducing changes that are impossible because they are in conflict with the monument protection laws and regulations.

The faculties located in old-new or new-old buildings (i.e. the second and third category) come with their own limitations, as even their deepest renovation cannot eradicate the basic architectural problems, such as long and narrow corridors in which it is impossible to arrange elaborate L&T spaces for the students' use there, or errors in design resulting in various problems (e.g. flooding the underground floors in torrential rains). Besides, the 15- or 20-year-old buildings that do not meet all the present standards in design are too new and too modern to be renovated. Their shortcomings are clearly seen in the interviews with the students: the differences in the opinions of the students of different faculties are huge.

From the perspective of the teachers, as well as the University and faculty authorities, the classrooms are mostly sufficient for the didactic purposes, as they are equipped with all the devices necessary for a given course (or institute), they can accommodate different numbers of students (therefore, both large lectures and smaller classes are possible to be conducted in comfortable conditions), and they are accessible for the people with disabilities. Since the Jagiellonian University is first and foremost a research university, the highest quality of the infrastructure for research is emphasized by many groups of stakeholders. In other didactic spaces, there is some room for improvement, though – for example, many teachers call for the replacement of fixed furniture with movable chairs and tables, whereas most students point to the insufficient number of electric sockets, which prevents them from using their own electronic devices for many hours.

The biggest improvements are required in the common spaces in many faculties. If students are to spend their time between classes effectively there, the halls must be furnished with cozy and comfortable spaces for teamwork, individual work, as well as relaxing. There should be larger and smaller tables, complete with easy access to electric sockets and a stable wi-fi connection. Also, a break room for students would be welcome, equipped with a microwave oven, an electric kettle, and some space to prepare and consume the food brought from home. There is such a room on some faculties, but the students from the older faculties feel it would be an important addition that could make them spend more quality time inside the building instead of wasting their time commuting for lunch and then back to the university.

Since the beginning of the project, when we started a discussion about L&TS at the Jagiellonian University, some changes have been introduced. The Faculty of Management and Social Communication is an excellent example here, as it used to be a large area with great yet unfulfilled potential. The talks in the focus groups seem to have inspired the authorities to install two booths for quiet individual study in the halls on the third floor, modeled to a great extent on the spaces we have seen in Birmingham (Illustration 2). Both units are comfortable and well-shaded from direct sunlight, which makes work on a laptop easy and enjoyable. They are equipped with a set of electric sockets, as well as USB sockets to charge electronic devices. The plush couch looks cozy and is very comfortable to sit on. In addition, the lamp gives warm yellow light, suitable for reading but also resting for the eyes. More such units are going to be installed soon.

Illustration 2

Own source

Changes are also noticeable outside, for example in the promenade in between the Faculty of Management and Social Communication and the Faculty of Mathematics and Computer Science (Illustration 3). New seats installed there, meant for larger groups as well as for smaller ones, encourage students to spend their time outdoor during the breaks in the warmer seasons. They

are open for the general public, too, thus constituting an excellent example of the connection between the city and the university. In the winter they are rarely used, yet in the spring they will likely be occupied most of the day. The covered set of benches will additionally be completed with a vine (there is some space provided for the flowerpot) that will provide shade.

Illustration 3

Own source

As for the digital spaces, they are varied and well-developed at the University. Also, the time of the distance learning and teaching enforced by the pandemic has turned out to be a real breakthrough in using them effectively for didactic purposes. Despite some initial difficulties, both teachers and students embraced the new mode of education smoothly, largely thanks to the IT support provided by the JU – the Distance L&T Centre and the Distance IT Centre. There are several platforms for synchronous and asynchronous education. They all come with their own strengths and weaknesses. At the beginning of the lockdown, each teacher chose their own favorite platform and has used it consistently since then. Students had to comply, hence their main claim, as expressed in the interviews, is to introduce some unification of the platforms, or

a set of guidelines so that they did not have to change between classes, and so that they could find all the notes and materials in one place.

Taking it all into consideration, we would like to make the following recommendations:

1. The renovation of the older buildings and the construction of new ones should be conducted in consultation with the groups of stakeholders that will be using them: the administration staff about the offices, the teachers (and students) about the didactic spaces, the students (and teachers) about the common spaces indoor and outdoor. If the architects learned the needs and expectations of the groups beforehand, the design and then the building would meet the stakeholders' requirements much better.

2. The renovation and construction should account for the modern needs, namely introducing blended and hybrid education. This mode of L&T already concerns a number of institutes to a smaller or larger extent, and it could be predicted that it is here to stay. Therefore, it is essential to design classrooms and lecture halls in which the teacher could conduct online courses while simultaneously talking to a group of people in this room, as well as the quiet spaces with wi-fi, comfortable desks, and at least a few computers with microphones and cameras, where students could attend online courses without the need to go back home. The latter development would also make preparing the timetable easier, as it would not have to accommodate one or two hours during the day just for commuting.

3. The University spaces should look and feel welcoming for the students so that they wanted to spend their free time there. Opening a number of cafés, pubs or students clubs at the Campus is definitely recommended, as it would make students spend their breaks between classes on the spot, without the need to go to the city center. It would also be very useful for the University staff, who could meet in such places after work – in their own company, with some foreign guests (e.g. the visiting professors), or with students (e.g. for a Christmas meeting, or for a seminar).

4. The experience gained by everyone during the 3 semesters of distance L&T should be cherished and reinforced, as it could greatly enhance the innovative blended and hybrid L&T methods. The online platforms could be used on a regular basis for assigning additional tasks, storing materials, or giving the students an opportunity to have some additional practice, for example as a form of revision before the final exam. Also, it could be used for distance education on specific days, for instance just before the Christmas break, or between a bank holiday and the weekend, when students would rather stay at home for a few days without the fear of missing classes.

5. Another aspect of digital spaces that could also be considered is appointing one or two platforms for general use (for example, Pegaz as a storage space for all the material, MS Teams for holding meetings online) to avoid the chaos of switching between platforms and keeping the notes in different formats and different places.

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