Call for proposals – 2021
Appel à projets vague 2
EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (**EXCELLENCES**)

Document de soumission / *Submission form*

Acronyme du projet / *Project acronym*	MINERVE
Project title (in English)	Strengthening integrative training and research to respond to international societal and economic challenges
Titre du projet en français	Renforcer une démarche de recherche et de formation intégratives pour répondre aux enjeux sociétaux et économiques internationaux
Keywords / mots clés (min 5 – max 10)	Interdisciplinary research and training Learning by Doing, Digital, Internationalisation, Sciences and Technology, Health
Responsable du projet / *Project manager*	Eric Blond, président de l'Université d'Orléans
	president@univ-orleans.fr | 02 38 49 47 21
Établissement coordinateur / *Leading institution*	Université d'Orléans
Partner institution(s) involved in the project / Institution(s) partenaire(s) impliqué(es)	Université de Tours INSA CVL CNRS BRGM INRAe CHRO
Project duration / Durée du projet entre 72 mois et 120 mois	120 Months
Requested funding / Aide demandée (minimum 5M€)	17,3 M€ | Full cost / Coût complet | 131,1 M€
Le cas échéant : Listes des projets PIA auxquels ce projet est éventuellement lié (notamment EUR, universités européennes, Equipex, Labex, Institut convergence, IDEFI, etc.) / *Project links with existing PIA entities (e.g. EUR, Equipex, Labex, Institut convergence, IDEFI, etc.)*	LabEx CAPRYSSES (coord) LabEx VOLTAIRE (coord) LabEx SYNORG (part) LabEx IRON (part) IDEFI édifice (coord) IDEFI CMI (2 coord) CMQ CosmetoPharma (coord) Université européenne ATHENA (part) PIA3 PRO-ATHENA (coord) AMI PRO3 DémoES (coord) Equipex+ Imagine2 (part) Equipex MesoNET (part) Equipex T-REFIMEV (part) Equipex+ TERRA FORMA (part) Equipex PLANEX (coord)

MINERVE

Call for proposals – 2021
Appel à projets vague 2
EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (**E**XCELLENC**ES**)

Document de soumission / *Submission form*

Ce projet s'inscrit-il dans le cadre d'une Initiative d'excellence labellisée IdEx ou ISITE ?	Non

List of partner institutions / **Liste des institutions partenaires**

Name of the research organisations / Nom des organismes de recherche	*Legal status* / Statut
BRGM	EPIC
CNRS	EPST
INRAe	EPST
Name of the institutions of higher education and research / Nom des établissements d'enseignement supérieur et de recherche	*Legal status* / Statut
Université de Tours	EPSCP
INSA CVL	EPSCP
Name of the Clinical Entity / Nom des établissements hospitaliers (services, unités…)	*Legal status* / Statut
CHRO (Centre Hospitalier Régional d'Orléans)	CHR
Other partners (Companies, Start-up, Associations, etc.) / **Autres partenaires (Industries, Entreprises, Start-up, Associations, etc.)**	*Field(s) of activity* / **Secteur(s) d'activité**
Conseil Régional Centre Val de Loire	Collectivité territoriale
Orléans Métropole	Collectivité territoriale

MINERVE

Call for proposals – 2021
Appel à projets vague 2
**EXCELLENCE SOUS TOUTES SES FORMES –
E**XCELLENCE IN ALL ITS FORMS (**EXCELLENCES**)

Document de soumission / *Submission form*

RESUME / *SUMMARY*

Abstract - English version (max. 4000 characters)

The University of Orléans aims to restructure the fields of training and research in science by creating two thematic poles, one in "sciences and technologies enhanced by data sciences", the other in "sciences of sport, rehabilitation and physical activity". These 2 poles integrating places of training and research will be built around a new model of graduate program of excellence: GPEx. Its objective is to acquire reengineering capacities and educational innovation platforms to sustainably support this transformation. GPEx is a new set of open, modular and adaptable training programs, designed for and by students to foster the emergence of a generation of specialized scientists capable of innovating. This model, initially focused on these two poles, could then be extended to other faculties at the University. GPEx should enable the construction of these graduated programs by strengthening existing tools and providing new tools to help students build their training pathway from the bachelor's degree to the PhD, according to their personal project, their profile and their own pace. In a transdisciplinary logic, the program relies on a strong integration of HSS in the science and technology training offers. These interdisciplinary courses are supported by innovative devices including digital sciences. The GPEx has a strong desire to promote the immersion of students in the research environment, right from the license. It is facilitated by the mobilization of existing laboratories and by the creation of a laboratory dedicated to the field of "sciences of sport, physical activities and rehabilitation". The University also wishes to develop new "learning by doing" capacities through federated "lab" approaches (X-Lab) and the definition of a service offer for students and teaching teams. The GPEx is also distinguished by its ability to develop partnerships around entrepreneurship through strong links created with innovative companies in the economic sector.

With the European university ATHENA, these graduate programs will also have a strong international dimension with the creation of an international network created for students deploying a dedicated offer of events and training. It is also proposed to develop an international showcase, the "Orléans International School of Science and Technology" to promote the GPEx model. Central services will be rearmed to support teaching teams and students to deploy a strategy for attracting, detecting, orienting and integrating students. A work of training offer promotion in a logic of orientation support, will allow secondary school students to know the opportunities offered by the GPEx and scientific mediation actions will be offered to students. The ambition of this program is therefore to profoundly transform the University, by changing its structure and supporting the teams in this change. This program is supported by a dedicated, inclusive, participative governance, which benefits from the experience acquired during previous PIA or European projects. It includes students and doctoral students as a force for proposals and evaluators. It is supported by the mobilization of key partners who will participate in the delivery of the expected impact of the program at the regional level (Région Val-de-Loire, Orléans Métropole, University of Tours, Regional Hospital Center in particular), at the national level (the major research organizations including BRGM, CNRS, INRAe) and at the international level with the European university ATHENA in particular.

Résumé en français (max. 4000 caractères)

MINERVE

Call for proposals – 2021
Appel à projets vague 2
EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (**E**XCELLENC**ES**)

Document de soumission / *Submission form*

L'Université d'Orléans a pour ambition de restructurer les champs de formation et de recherche dans le domaine des sciences en créant deux pôles thématiques, l'un en « sciences et technologies augmentées par les data sciences », l'autre en « sciences du sport, de la rééducation et des activités physiques ». Ces 2 pôles intégrant lieux de formation et de recherche se construiront autour d'un nouveau modèle de programme gradué d'excellence : GPEx. Son objectif est de se doter de capacités d'ingénierie et de plateformes d'innovation pédagogiques pour accompagner cette transformation durablement. GPEx est un nouvel ensemble de programmes de formation ouverts, modulaires et adaptables, pensés pour et par les étudiants pour favoriser l'émergence d'une génération de scientifiques de spécialités capables d'innover. Ce modèle, focalisé dans premier temps sur ces deux pôles, pourra ensuite être étendu à d'autres formations du site. GPEx doit permettre la construction de ces programmes gradués en renforçant les outils existants et en créant de nouveaux outils pour amener l'étudiant à construire son parcours de la licence au doctorat, en fonction de son projet personnel, de son profil et de son rythme d'apprentissage. Dans une logique transdisciplinaire, le programme repose sur une intégration forte des SHS dans les offres de formation en sciences et techniques. Cette interdisciplinarité du parcours est soutenue par des dispositifs innovants incluant le numérique et plus spécifiquement les data sciences. GPEx porte une volonté forte de favoriser l'immersion des étudiants dans le milieu de la recherche, et ce dès la licence. Elle est facilitée par la mobilisation des laboratoires existants et par la création d'un laboratoire dédié au domaine « sciences du sport, des activités physiques et de la rééducation ». L'Université souhaite aussi développer de nouvelles capacités « d'apprentissage par le faire » grâce à des approches « lab » fédérées (X-Lab) et la définition d'une offre de service pour les étudiants et les équipes pédagogiques. GPEx se distinguera aussi par sa capacité à développer des partenariats autour de l'entrepreneuriat par des liens forts créés avec des entreprises innovantes du secteur. Ces programmes gradués auront aussi une dimension internationale forte avec la création d'un réseau international créé pour les étudiants déployant une offre dédiée d'événements et de formations. Il est aussi proposé de développer une vitrine internationale, la « Orléans International School of Science and Technology » pour promouvoir le modèle GPEx. Les services centraux seront réarmés pour soutenir les équipes pédagogiques et les étudiants pour déployer une stratégie d'attraction, de détection, d'orientation et d'insertion des étudiants. Un travail de promotion de l'offre de formation dans une logique de soutien à l'orientation, permettra aux élèves du secondaire de connaître les opportunités offertes par les GPEx et des actions de médiation scientifique seront proposés aux étudiants. L'ambition de ce programme est donc de transformer en profondeur l'Université, en faisant évoluer sa structure et en accompagnant les équipes dans ce changement. Ce programme est porté par une gouvernance dédiée, inclusive, participative, qui profite de l'expérience acquise lors des précédents projets PIA ou européens, qui inclut des étudiants et des doctorants en tant que force de proposition et évaluateurs. Il se nourrit de la mobilisation de partenaires clés à ses côtés, qui participeront à la livraison de l'impact attendu du programme à l'échelle régionale (Région Val-de-Loire, Orléans Métropole, Université de Tours, Centre hospitalier régional notamment), à l'échelle nationale (les grands organismes de recherche dont BRGM, CNRS, INRAe) et à l'échelle internationale avec l'université européenne ATHENA notamment.

MINERVE

Call for proposals – 2021
Appel à projets vague 2
EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (**E**XCELLEN**ES**)

Document de soumission / *Submission form*

1 CONTEXTE ET POSITIONNEMENT DU PROJET / *CONTEXT AND SCOPE OF THE PROJECT*

1.1 WHO ARE WE? WHAT ARE OUR STRENGTHS IN TRAINING AND RESEARCH WE WANT TO BUILD ON?

Founded in 1306 by Pope Clement V, the University of Orléans (UO[1]) is one of the oldest European universities. Renowned across Europe, the university is characterised by its multi-disciplinarity: three faculties (Science and Technology; Humanities and Social Sciences; Law, Economics, Management), an engineering university school (Polytech), four University Institutes of Technology (IUT), a National Institute for Professors and Educators (INSPE), an Observatory of the Sciences of the Universe (OSUC), and a University School of Physiotherapy (EUK). Over 20,000 (of which 2,000 international) students follow studies across the seven campuses that make up the University in Orléans, Bourges, Chartres, Chateauroux, Issoudun, Blois, and Tours.

In the field of training, our project is based on the current strengths of three components of the University of Orléans. The UFR ST (*Unité de Formation et de Recherche Sciences et Techniques – Faculty of Sciences and Technology*), the largest component of the university (4900 students, of which 4140 Bachelor, 740 Master students) covers the fields of computer science, mathematics, chemistry, physics, life sciences, and sciences and techniques of physical activities and sports. It currently offers a wide range of Bachelor and Master's degrees and has extensive experience in the provision of apprenticeship (dual education) programmes. The OSUC, cofounded in 2009 by the CNRS, the UO and the Observatory of Paris, is both an observatory and a school with 70 Bachelor and 75 Master students. OSUC brings together several research teams and laboratories on the theme of "Space, Planet and Environment", and is subdivided into the fields of Atmosphere and Interfaces, Radio Astronomy, Gravitation, Astrobiology, Geology and Planetary Sciences, with three assignments: observation, research and training. The EUK (*Ecole Universitaire de Kinésithérapie*), the first French university school in the field of rehabilitation sciences, was created in 2019 and has strong collaborations with the two regional hospitals (CHU of Tours and the CHR of Orléans). With currently 370 students, its objective is to train practitioners in physiotherapy and, since 2021, to deliver a Master's degree. Within these faculties, more than two hundred teachers-researchers and a hundred researchers are providing rich learning experiences for our students, such as:

- The setting up of 2 CMIs (Master's in Engineering) supported by the FIGURE network and funded by an initiative of excellence in innovative training (IDEFI) of the PIA investment programme: one in Chemistry for Therapeutic and Cosmetic Innovation, the other in Statistical Engineering of Data and Modelling. With a 5-year curriculum devoted to the progressive acquisition of a speciality with additional training time for the development of cross-disciplinary skills and projects in international companies or laboratories, this experience has shown the value of interdisciplinary training for the professional integration of students.

- The establishment in 2020 of a CosmetoPharma Campus of Professions and Qualifications (CMQ), winner of a PIA Investment Program called "Territories of Educational Innovations", which structures a training sector and relies on the WeLab Cosmetic, a technological platform of equipment and skills open to academics and industries and thus

---

[1] Cf. annex for details on acronyms, programs titles and corresponding URLs

MINERVE

Call for proposals – 2021
Appel à projets vague 2
EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (ExCELLENCES)

Document de soumission / *Submission form*

responds to socio-economic needs expressed in the field of cosmetics and pharmacy. Training in the CMQ is positioned from Bachelor degree to PhD level.

- The establishment of a network between high schools of the Orléans-Tours academy and the University of Orléans, the CNRS, the BRGM, and the INRAe through the EDIFICE project funded within the PIA-IDEFI program. This network has developed a culture of supporting high school students in their choice of career paths.

- The PRO3 project (winner of the DemoES Call for proposals), which aims to use digital technology in higher education to make it more student-friendly, more professional and environmentally respectful. The project is led by the UO on behalf of five actors in the field of higher education, research and innovation in the CVL Region, namely: CNAM, INSA CVL, the universities of Orléans and Tours, in partnership with BRGM and 2 DeepTech companies.

In addition to the co-foundation of ATHENA European university (called ATHENA hereafter, see below), UO developed other successful projects that show the institution's strong involvement in digital transformation:

- the Orléans Digital Graduate School (GSON) opened in 2017: it offers a complementary and multidisciplinary (Economics, Chemistry, Biology, Physics, etc.) training programme in the field of data sciences fo Master's and PhD students.

- The Digital Learning Lab: it offers an innovative learning method by setting up project teams made up of students from all disciplines, managers, and employees of companies, supervised by a teacher/digital professional pair, who work together on a digital-technology problem brought up by a company or an educational establishment.

In the field of research our project is based on world-class scientific activities that are developed by 220 academic staff within 25 research laboratories located on the Grand Campus d'Orléans site. On this campus, UO has strong territorial and socio-economic roots, and collaborates with an ecosystem that includes 2 other institutions (University of Tours (UT) and INSA CVL), French national research organisations (CNRS, INRAe and BRGM), the two regional hospitals (CHR of Orléans and the CHU of Tours), the Observatoire Paris-PSL and the CNES. Several UO laboratories are joint-units with these institutions. Academic research at UO is organised in 4 broad cross-disciplinary themes to create real-world impact and innovation: (i) Materials chemistry, physics, power engineering, geoscience, environment, and space science; (ii) Human and plant biology, life chemistry, sports and physical activity sciences, and health and well-being; (iii) Letters, languages, history, geography, law, management, and educational sciences; (iv) Mathematics, Computer Science, Economics, Linguistics, Automation and Signal Processing, and Systems Engineering. Five doctoral schools are connecting teaching and research missions of the University. **In the field of science and technology research**, the laboratories founded with our partners have been structured over the past few years around strong identified themes by combining their skills in the fields of cosmetics, multi-materials, geosciences, space, data sciences and artificial intelligence, chemistry and life sciences, imaging science, energy, and environment in ambitious national and international projects and by developing highly competitive experimental and digital platforms. Our strong and broad disciplinary research-based enables laboratories to join their expertise in answering calls of project from regional, national, and European funding instruments. The University of Orléans recently obtained ambitious scientific projects. At the regional level, we can

MINERVE

Call for proposals – 2021
Appel à projets vague 2
EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (**EXCELLENCES**)

Document de soumission / *Submission form*

name the Ambition Research and Development (ARD) programs funded by the Region CVL council such as ARD Cosmetociences (Cosmetic), ARD MATEX (Multimaterials in Extreme Conditions), ARD Junon (Environment and Data Science) and other ARDs in which UO laboratories are partners (ARD Biomedicaments, ARD CERTeM, ARD SyCoMore). The UO manages 2 Regional Thematic Research Networks in digital and health sciences. At the national level, the university is leading the Industrial Chaire called ACXEME (Ignition, Combustion, Explosion, Environment and Energetic Materials), the LabEx Voltaire (Geofluids and Volatile Elements – Earth, Atmosphere, Interactions – Resources and Environment; the CAPRYSSES LabEx (Chemical Kinetics and Aerothermodynamics for Clean and Safe Propulsions and Energy Systems), and is partner of the SYNORG (Organic and analytical chemistry) as well as of the IRON LabEx (Innovative Radiopharmaceuticals in Oncology and Neurology). In terms of infrastructures and platforms, strong dynamics continue with the creation, more recently, of a new data centre for pooling regional digital resources. Thus, by the end of 2020, the BRGM, the UO, the UT and INSA CVL joined forces to set up CVL regional Data Centre, a joint infrastructure offering innovative services to all teachers-researchers and researchers in the region. At the European level, researchers at the UO obtained recently an ERC Starting Grant (TRACE-it) in geosciences (Horizon Europe Programme), and other Horizon2020 EU's research and innovation programmes: 3 RISE and 1 CleanSky at coordinator level (STANDUP, ENDORSE, RESPECT, PERSEUS), 3 at beneficiary level (UNTANGLED, FLEXnCONFU, ATHOR) and 5 at third-party level. **In the field of sciences of sport, physical activity and rehabilitation**, the strength of the research at UO is based on a diversity of fields of expertise (e.g., biology, physiology, biomechanics, physical therapy, psychology, sociology, ergonomics) with projects linked to the regional hospital environment but whose location (Orléans, Paris) induces sometimes a fragmentation. One main goal of the project is to benefit from this diversity whilst dealing with such fragmentation, by creating a differentiating and specialized laboratory that is missing in the region.

UO is a major actor of the territorial development in the Region and our project will also build upon this position. Firstly, thanks to professional integration support solutions for students targeted in economic fields where skilled candidates are missing. With its focus on training innovators, UO develops with students the ability to anticipate and adapt to new situations and complex challenges, which has become a crucial factor in economic and social development at the regional, national, and international levels. Secondly, UO also accompanies the transformation of health care professions in the CVL Region to respond to societal challenges with the evolution of its training portfolio, implementing a thorough organizational transformation to further connect training and research. The strategy of the UO, through its multidisciplinary research laboratories is in line with the regional ambitions for the development of higher education, research and innovation, the fundamental basis for increasing the individual and collective agility of the territory, creating economic value, and succeeding in the societal transitions of our Region. Lastly, strong collaboration with Orléans Val de Loire Technopole (support for the creation and development of companies), through the Lab'O, strengthens the capacity of innovation of the university, in particular its capacity of technology transfers and start-ups incubation.

UO is also investing in its international development and this PIA4 Project will leverage this effort. The construction of the European space of Higher Education Research and Innovation is one

of its major ambitions. In June 2020, the UO was awarded the "Human Resources Excellence Strategy in Research" (HRS4R) label by the European Commission. UO is co-laureate of the European Universities Initiative. ATHENA, an alliance of seven higher education and research institutions with a focus on digital transformation for societies is one of the flagship projects of the European Union aimed at making Europe's universities more open to the world, efficient and inclusive. The project brings together the universities of Orléans, Siegen (Germany), Maribor (Slovenia), the Polytechnic Institute of Porto (Portugal, coordinator), Vilnius Tech (Lithuania), Niccolò Cusano University (Rome) and the Hellenic Mediterranean University (Greece). The project is further supported by the ANR through the PIA3 in order to strengthen the research and training activities at the UO within the ATHENA consortium. To support further its international development, UO is involved in LE STUDIUM Loire Valley Institute for Advanced Studies, which covers all research themes in one global initiative aiming at boosting international scientific exchanges in the CVL Region to create a dynamic scientific community that supports research and innovation.

1.2 HOW IS THE PROJECT POSITIONED IN THE INSTITUTION'S STRATEGY AND TRANSFORMATION?

« Learning is experience. Everything else is information. » *Albert Einstein*

Based on these strengths in education and sciences, based on our strong regional roots and our success at the international scale, our project, through a restructuring of the training and research forces, aims to create two new integrated training and research poles, one based on science and technology and the other one on the sciences of sport, physical activity and rehabilitation. With the creation of these two poles and the implementation of pedagogical transformation, the main goal of our project is to give students the opportunity to build their knowledge step by step, to develop their critical thinking, their curiosity and their ability, to be surprised by a pedagogical approach linked to an international environment and based on learning by doing. The coupling of an early and progressive immersion in research and innovation laboratories and learning platforms, and a diversity of approaches, both experimental and digital, in a variety of disciplinary fields combining "hard" sciences and humanities and social sciences is the fertile ground that will be made available to this future generation of inventors. We aim to create two ecosystems that interweave the training and research spaces and structure the two above mentioned fields to accelerate the UO transformation:

A pole that will bring together all scientific disciplines and will be a pilot in the development of a new transdisciplinary training approach (including humanities and social sciences (HSS)HSS and digital science in particular), involving early and progressive immersion in the research laboratories, open to the international arena, promoting a "learning by doing" approach with dedicated platforms, in order to encourage the emergence of a generation of specialised scientists who master the experimental and digital approaches; we called "GPEx" this new graduate program standard adapted to UO's community we want to implement during the next ten years.

- A pole that will structure education and research in the sciences of sport, physical activities and rehabilitation, that will continue the dynamics of universitarization of training in the field of rehabilitation and will accompany the emergence of the "sciences of re-education and rehabilitation" new disciplinary section (section 91 of the CNU). This pole will make it

MINERVE

Call for proposals – 2021
Appel à projets vague 2
EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (**E**XCELLEN**C**ES)

Document de soumission / *Submission form*

possible to consolidate and further develop health-and-performance related science at UO. Indeed, while many researchers in Orléans develop scientific activities in these fields, their visibility is limited as they are scattered across different laboratories outside UO. It is essential to help these academics to reintegrate locally and subsequently to support this pole to develop a quality health-and-performance research, education and training portfolio; the training offer will implement the same "GPEx" design standard.

Thus, the creation of the two new poles by transforming the current structure around UFR ST, OSUC and EUK will mobilize:

- the opportunity provided by the CPER real estate programme, to make premises available to physically bring together the research forces of these two poles in dedicated locations, and to allow the development of new learning platforms called X-Lab;
- the experience of collaborative pedagogical and research projects, proof of concept to be disseminated within all training courses and within ATHENA;
- the culture of accompanying high school students to convince them of the opportunities offered by the training courses for their better professional integration through ongoing programs implemented with secondary education authorities;
- the integration of the MSH to participate in the cross-fertilization of hard sciences and HSS;
- the transformation of our central services (beginning in 2022) to increase our dynamic in setting up international projects (DRI), to develop innovative pedagogical tools (Learning Lab), to support teams in the transformation of their organisation (HR service), to monitor project indicators as part of a quality approach (DPPA), to communicate on the actions (communication service), to manage partnerships and financial indicators (DRP) and to lead the redesign and the continuous improvement of the training offer for the whole University (creation of a deputy position of General Director of Central Services).

This project will substantially strengthen our identity and underline our distinctive characteristics as a university driven by today's societal challenges at regional, national, and European level. This project will mark the evolution of the UO signature with a more visible "rehabilitation science dimension" that will structure the regional field in this domain: for example, the creation of the new research laboratory will support the regional hospital in developing its research and training capacities. The university will develop its "innovative pedagogy" signature according to the "learning by doing" angle, initially in the field of "hard" sciences, and which will have the vocation to spread throughout the open space of ATHENA and towards other disciplinary fields: our "GPEx" graduate program model will increase research-training integration, international attractiveness but with a specific focus on empowering students for them to create and innovate through their academic experience as entrepreneurship students. Moreover, this project also aims to consolidate transdisciplinary approaches that bring a human and social vision to the scientific issues of innovation. This, in turn, will enable us to better fulfil our mission, we will implement a management plan to mobilize teachers, researchers, and other staff members supporting students with their projects.

Call for proposals – 2021
Appel à projets vague 2
EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (**EXCELLENCES**)

MINERVE

Document de soumission / *Submission form*

1.3   WHAT DOES THIS PROJECT BRING TO THE INSTITUTION, ITS STAFF, AND ITS STUDENTS? WHAT ARE THE GAINS WE WILL TRACK?

For students, we will be careful to objectify the fact that their learning experience will change radically. We will take a significant step towards a personalized pathway with a modular approach to teaching: we will measure student satisfaction with this new architecture of education and training portfolio. Thanks to a better integration between research and education, we will provide several activities in the laboratories for students. These students will be supported so that they can integrate societal issues into their research projects. As project leaders, students will be involved in designing their own training experience. They will also be able to tutor their peers once they are recruited by a laboratory. Thanks to international mobility, to the mobilization of our ATHENA network, but also thanks to our regional partners, we will carry out actions whose success will be measured by our student's employability, locally and internationally (cf. annex for details on KPI).

For staff members, there will be specific support, such as a communication and training plan that will make our project and the transformation of the university efficient and sustainable. Progress regarding this management plan will be monitored by the steering committee, and we will mobilize professionals for the HR department and experts in pedagogical innovation from our Learning Lab. We will accompany our team members in an increased versatility in the fields of research and training to optimize the link between the two fields. We will develop a teachers' toolbox by integrating "learning by research" and "learning by doing" approaches. We will evaluate with the teachers our management plan and the quality of the tools made available to them. For teams concerned in the central services, we will develop a business partnership culture: the goals that students, teachers and researchers want to achieve in their projects must be theirs as well and in a complementary way students, teachers and researchers must integrate members of central services in their project teams.

For UO, its signature will be more assertive and visible at both regional and international levels but above all, this project will both build and accelerate the operational transformation of the institution. This ambition is central and is the subject of a dedicated section in the project description (see below 2.7).
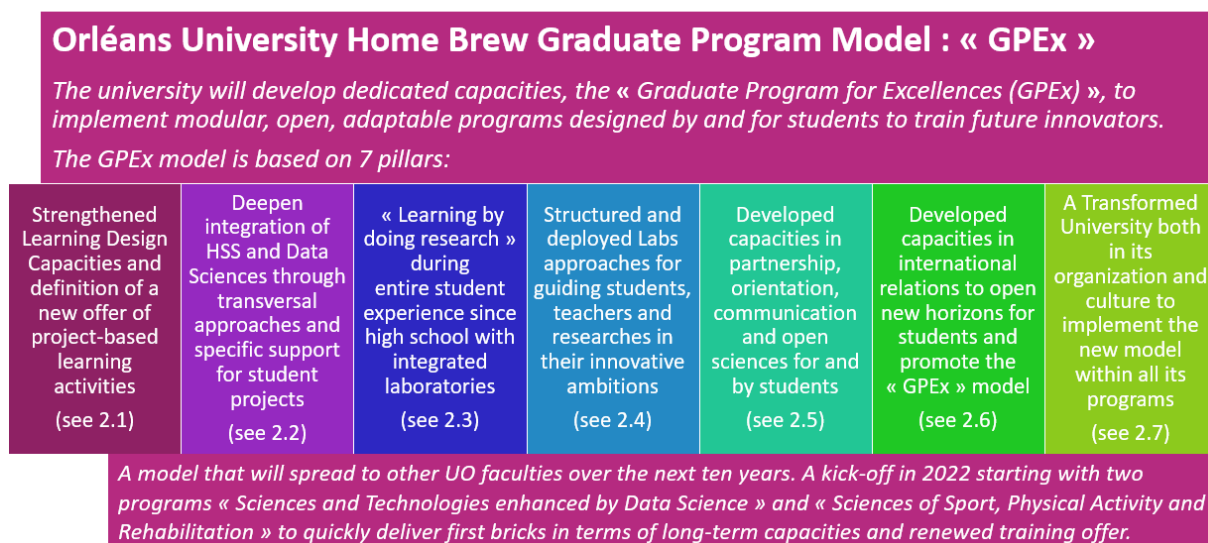
MINERVE

Call for proposals – 2021
Appel à projets vague 2
EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (**ExcellencES**)

Document de soumission / *Submission form*

Figure 1: Architecture of MINERVE PIA4 project

Orléans University Home Brew Graduate Program Model : « GPEx »

The university will develop dedicated capacities, the **« *Graduate Program for Excellences (GPEx)* »**, *to implement modular, open, adaptable programs designed by and for students to train future innovators.*

The GPEx model is based on 7 pillars:

Strengthened Learning Design Capacities and definition of a new offer of project-based learning activities (see 2.1)	Deepen integration of HSS and Data Sciences through transversal approaches and specific support for student projects (see 2.2)	« Learning by doing research » during entire student experience since high school with integrated laboratories (see 2.3)	Structured and deployed Labs approaches for guiding students, teachers and researches in their innovative ambitions (see 2.4)	Developed capacities in partnership, orientation, communication and open sciences for and by students (see 2.5)	Developed capacities in international relations to open new horizons for students and promote the « GPEx » model (see 2.6)	A Transformed University both in its organization and culture to implement the new model within all its programs (see 2.7)

A model that will spread to other UO faculties over the next ten years. A kick-off in 2022 starting with two programs « Sciences and Technologies enhanced by Data Science » and « Sciences of Sport, Physical Activity and Rehabilitation » to quickly deliver first bricks in terms of long-term capacities and renewed training offer.

2   PROJECT DESCRIPTION: DEVELOPMENT OF LEARNING DESIGN CAPACITIES TO CREATE A MODEL OF GRADUATED PROGRAMS OF EXCELLENCE CALLED "GPEX"

The main deliverable of the project is to define and implement a generic architecture of pedagogical models called "GPEx" intended for training focused on innovation and research, favouring the personal project of the student, modular and adaptable, to build a training model of excellence at doctorate degree including: (1) an existing disciplinary-based training that will have benefited from a reengineering to provide a strong modularity/personalization of courses, scientific and educational mentoring, continuous enhancement of the progression of achievements; (2) an opening towards HSS and an appropriation of digital methodologies; (3) a progressive immersion in Research/Development/Innovation since high school; (4) an interdisciplinary "learning by doing" approach; (5) a "partnership" approach and development of entrepreneurship with awareness of societal issues and scientific mediation; and (6) an active international reach.

The approach is intended to be progressive, creating the conditions that will lead a student to embark on the path of innovation and research, and this at the highest level of excellence, both in the themes and in learning styles. The purpose is to attract at different levels, from high school to university, students eager for the concepts and methodologies leading to scientific and technical innovation. Different innovative tools will be developed allowing the student to move from spectator to actor then to designer, with a progressive involvement in research/innovation. This pedagogical model of excellence aims to be applied to all disciplinary sectors, to all training compatible with an innovation approach by pooling an architecture and transversal tools. During the first phase of the project "Sciences and Technologies enhanced by DATA science" and "Sciences of sport, physical activity and rehabilitation" will define the first domain to be reengineered followed by all university programs during the next 10 years.

2.1   DEFINITION OF A NEW STANDARD OF OPEN, MODULAR AND ADAPTED GRADUATE PROGRAMS FOR ORLÉANS UNIVERSITY CALLED "GPEX"

The architecture proposed for these "GPEx" courses will make it possible to adapt to the students' personal project, to their profile and their rate of learning in the temporality of the LMD system.

MINERVE

Call for proposals – 2021
Appel à projets vague 2
EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (**EXCELLENCES**)

Document de soumission / *Submission form*

Supported on the disciplinary base (2.1.1) of the more monolithic traditional training, the courses will be structured considering: transversal units (2.1.2) on methods and tools for research and more thematic but multidisciplinary workshops/school (2.1.3), associated with research projects putting into practice complementary natures where questioning, autonomy and collaborative work are both an objective and a method (2.3). The strategy developed in this course model and in the innovative tools associated with it, will be coordinated by an educational and scientific engineering team, the "Learning Design Task Force" that will support students and teachers/researchers.

In addition, the UO wishes to develop a strategy for attracting, detecting and orienting students in different ways (2.1.4 -2.1.5). If the rate of students coming to university who will pursue a career in research and innovation is already excessively low, the rate of students obtaining a master's degree and enrolling in a doctoral thesis is also worrying less than 20% of all ST Masters combined. The reason is the lack of a long-term vision, particularly on opportunities, even in ST, while more than 90% of ST students find a job, on average, within 6 months after graduation. Thus, the strategy shall also develop a feeling of belonging during the "GPEx" training of excellence (cf. 2.5-2.6 international alumni network)

2.1.1 Develop full compatibility with disciplinary core courses of Orléans University (Bachelor and Master)

Starting from the 2024 new accreditation program, the training models of "GPEx" will be built upon existing disciplinary programs and upon "on demand" training courses and students cross-disciplinary projects. The proportion and nature of disciplinary learning will be adapted to the student's project. However, beyond the organizational aspect, the long-term objective is to set up a disciplinary training, both the "program approach", advocating an objective of acquiring skills rather than a single sum of knowledge, and the appropriation of instrumental or virtual "learning by doing" tools (cf. 2.4 X.LABS). These transformations will promote the emergence of modern learning for students, future actors of innovation.

2.1.2 Mutualize or create specific transversal courses, in HSS and Data sciences

The training of students in the research process requires the integration of several types of skills beyond the strict disciplinary field of science and technology, backed up by the humanities and social sciences (HSS), which are little integrated today. On the contrary, we believe that the HSS enhance the culture of curiosity and analysis, critical thinking, the methodology of collaborative work, economics, management, scientific mediation and provide tools that must now be integrated into the innovation process: quality and standards, sustainable development, innovation law, ethics, etc.

2.1.3 Create thematic courses on several disciplinary fields through adapted courses or conferences/schools

Finally, awareness of the importance of interdisciplinarity within the science and technology corpus will be at the heart of GPEx, allowing an association of multidisciplinary skills to address thematic issues. Two types of learning open to students and doctoral students are offered: i) adapted bi-disciplinary courses where a discipline provides tools or insights into a problem stemming from another discipline; and ii) intensive days of workshops/conferences, bringing experts together (internal, external, or international). Data science (2.2.2) is a key example of what the digital

		MINERVE

Call for proposals – 2021
Appel à projets vague 2
EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (EXCELLENCES)

Document de soumission / *Submission form*

approach can bring to support experimentation or, on the contrary, to make accessible a complexity that theory cannot describe. As such, the ATHENA will be an effective vector for the creation of international summer and winter schools on digital transformation. Other cross-cutting themes such as spectroscopy, therapeutic tools, extreme conditions, ethics ... in the strategic field areas of UO will be treated and enhanced by supervised projects.

2.1.4 Implement an awareness and attractiveness strategy for students

To attract students, different strategies will be implemented at different levels. For high school students is to detect their appetite for innovation, to immerse them in the research environment very early on (2.3.1), to develop learners' critical thinking and then to support their orientation and their knowledge of the research professions, and this with the participation of researchers and doctoral students who will be trained in scientific mediation (2.5). For undergraduate students is to detect those who are interested in innovation and research, allow them to join GPEx courses each year, and introduce them, to the processes and methodologies of innovation (e.g., critical thinking, entrepreneurship). The idea is to create attractive elements for students selected in the GPEx such as "scholarships of excellence" in Master 1 or "apprenticeship contracts" in Master 2 in companies as well as in research labs. The purpose is to formalize the immersion (outside the teaching slots) of students in research and innovation and orient them towards GPEx. The communication-information strategy for students also involves the actions of GPEx students themselves. As for example, the participation in challenges: Prize of innovation, creation of company "CréaCampus", international challenges via ATHENA.

Finally, the selection of student candidates for the GPEx project will begin from the 1st year at university via the "Parcoursup" tool for students with a maturity in the innovation process (e.g., having followed the initiation workshops in high school), but also at the end of year1 and the end of year 2. Recruitment capacities will be conditioned by the support capacities of the teaching team and the supervision capacities of students in laboratory immersion, both developed during the program (see 2.2 and 2.3).

2.1.5 Implement the orientation and assistance system for the success and integration of students

The "Learning Design Task Force" will be the central support structure for implementing GPEx. This task force will be made up of pedagogical and scientific engineers, teachers and researchers from the disciplinary fields concerned. Training tools to help validate knowledge such as video clips summarizing "the essentials" of each lesson will be produced and accessible online to all students of and out of the GPEx , as well as access to virtual training SIMLAB and WEBLAB (2.4.2 and 2.4.3). Finally, the strategy for integrating students into the professional environment during and after training involves the creation, of a network of academic ATHENA and industrial partners, but also a network of former GPEx students. These international networks are essential to securing and sustaining the GPEx model.

2.2 INVESTING IN THE INTEGRATION OF HSS AND DATA SCIENCES IN THE "GPEX" MODEL

The innovation attitude requires the student to gain skills beyond their disciplinary scope, and open their mind to the economic, financial, juridical, regulatory, environmental, and cultural aspects of any novelty processes in industry or research. UO has areas of excellence in these domains that

MINERVE

Call for proposals – 2021
Appel à projets vague 2
EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (EXCELLENCES)

Document de soumission / *Submission form*

provide the best basis to design complementary courses fitting the needs of enriching the pathway of reasoning of mainly experimentalist students. In addition, the goal is to develop a large use of IT tools and methods in any scientific branch explored by the program. One of the best tools to test an idea, to perform a parametric study, or to prospect the up/down-scale effects is to model them. Moreover, all along the creative process, the dialogue between experiments and numerical modelling can be constant and fruitful and allow to save time and money. Another dimension of these complementary approaches is to promote the mixing between young students from various majors, confirmed professionals in search of a new start in their career, doctoral students interested to widen the scope of their skills. This part of the program is also intended to let behind any zone of comfort especially the linguistic aspect, with courses entirely delivered in English.

The disciplines of Social Sciences and Humanities (HSS) can boast a solid experience of team working, both internally and in an interdisciplinary view through the UO research group alliances (HCS, MSL), through the MSH Val de Loire, or the RnMHS *(Réseau National des* MSH). Our current objective is to go beyond these existing forms of cooperation and build and develop an offer of new original and challenging courses in HSS to strengthen students' interdisciplinary skills; such competences are crucial nowadays on the job market. More precisely, we aim to consolidate interdisciplinary work through the HSS within a "training through research" perspective. This ambition relies on reconfiguring the training offer by the HSS (*e.g.,* courses on law and health; business management; economics and geography; artistic and linguistic representations of the environment directed at students from all fields. Several actions can be devised in this perspective. A training within different Masters in HSS that can pool together newly created courses with existing modules, will be developed and open to students from various fields. This can be complemented by specific classes to be included directly in the GPEx (*e.g.,* ethics) or by the integration of the GPEx students in specific paths to be created in some HSS Masters (*e.g.,* creation of a Business Administration track in one of the IAE Masters, offering dual skills). A part of the HSS training will be provided in English: this will encourage exchanges (*e.g.,* via ATHENA). At Doctorate level, a specific training program will be organised, open to PhD students from a diversity of fields.

Data processing is omnipresent in our research and training fields. The objective is to offer a high-level training programme in data science, at the confluence of digital sciences (computer science, applied mathematics) and application fields. The first task is to set up training modules. The target audience is mainly made up of students whose main field is not directly related to data science. Thus, part of the teaching is intended for learning programming, mathematical modelling, mathematical and computer methods for data mining and machine learning. The range of subjects goes from elementary courses (programming, statistics) to advanced teaching (deep learning, HPC, big data processing). A second category of courses is devoted to the use of data science methods in various fields of application: geosciences, environment, energy and materials, biology and chemistry, economics and management, humanities and social sciences. Such courses are addressed both to students in applied mathematics and computer science and to students already familiar with the application domains who aim at developing skills in digital methods. This training provision, open to all Master and Doctorale students, should be complemented by specialised master's degrees with a dual competence in data science and some specific application fields. The construction of

Call for proposals – 2021
Appel à projets vague 2
EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (**ExcellencES**)

MINERVE

Document de soumission / *Submission form*

this training will be based, in addition to our academic skills, on consultation with economic partners (industry, banks, local authorities). For the development of academic partnerships around digital technology, we can count on Lab'O (an impressive combination of buildings and services devoted to start-ups and technology transfer, hosting a Lab'IA programme in artificial intelligence) and competitiveness clusters as DREAM/France Water Team (devoted to water and environment) and Cosmetic Valley. We aim at developing apprenticeship programmes for our students, but also tailor-made courses in data science adapted to the needs of our economic partners. Digital transformation is at the core of the ATHENA. We rely on the synergy with the ATHENA consortium to implement such courses and pedagogical resources in Orléans. The ATHENA programme is also an opportunity for attracting exchange students to Orléans during the semesters and for summer/winter schools.

2.3 INVESTING IN STUDENT IMMERSION IN THE RESEARCH/INNOVATION ENVIRONMENT

The chief driving force of the project is to immerge the students in the innovation/research processes to early orient them to the frontiers of knowledge, give them the habit and the taste to question the routine and the established certainties, make them familiar with the methodology of starting from a question or an idea "back of an envelope" to result finally into a proof of concept. All of this redline is to give to all students a deeper confidence in their capabilities to ask the right questions and to pursue them until defining new procedures, new products, new methods, etc. This objective means developing the culture of curiosity and the taste for novelty and risk, of course normalized with the ambition of each student, his/her skills and engagement. The students formed along that line could fertilize the research and industrial world by naturally identifying limits or new resources, able to tackle the problems related to changes, whichever the conceptual/engineering level of this limit/resource.

Students will be motivated to delineate and submit personal projects all along their cursus, turned to "try and practice" in the framework of a research laboratory or a R&D service. All proposals will be closely studied by a committee twice a year for validation or rebuttal. UO offers a lot of assets to drive such types of projects, by the diversity of scientific disciplines present on the campus, the large network of institution and industrials related to the academic labs. These features are specially enforced by the moderate size of the UO which have naturally led many labs of various disciplines to exchange and interact. The project will participate in linking teaching and research over the whole domain of the experimental sciences (2.3.1). In terms of inter-disciplinarity, the presence of an active pole in HSS and in data science should be mentioned. Efforts will be made in human resources to manage cross-fertilization in these disciplines (2.3.2). The experimentation in health sciences is for the time being rather turned to teaching than research: that's why UO wants to densify research by creating a new laboratory (2.3.3).

2.3.1 Strengthen existing tools and create new tools for immersion in the research/innovation environment

Doing an internship is part of the classic university cursus worldwide: GPEx model wants to put the student at the core of the project instead of being propelled on the project of a PhD student or a researcher to act there as a sort of assistant. Our objective is to define and develop three new tools devoted to the early initiation of the students to generating questions, and to designing adequate experiments, with an increasing tension with time for gaining ambition, genericity and autonomy.

MINERVE

Call for proposals – 2021
Appel à projets vague 2
EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (**ExcellencES**)

Document de soumission / *Submission form*

Create the R&D and Innovation Progressive Immersion Projects in laboratories: These projects are twofold and constitute the intermediate link from the classic to the new concept of internship. This first purpose is suggesting students as early as during the pre-university years (see dedicated actions 2.5) to entirely decompose a successful (historical) innovation strategy and analyse its different steps in depth. The second purpose, once students are at UO, is allowing them to spend time in the laboratory to learn (e.g., assist to develop a prototype to contribute to a specific experiment or to the coding of a model). These projects will be very early proposed to the new promotion as well as the methodology to co-build new projects. To be efficient, it seems important that the students could have a place where pedagogical supervisors could welcome them, give them literature or information, and organize meetings with given supervisors/mentors according to their interests and motivations (GPEx Totem Place).

Developing Personal Independent Learning Projects: This second type of internship is an entirely new concept, susceptible to start at any time of the cursus. The student defines a program of a practical study identifying with an experienced supervisor which scope of knowledge (academic concepts, technical skills) the project will bear upon and use all along the planned project. The concepts and skills thus understood in depth owing to this project will justify removing certain academic courses to give the student spare time for running his/her project. Obviously, the final examination of the project will include an analysis *a posteriori* of the degree of understanding of the academic knowledge purposely mastered throughout the study. The method to build such ambitious program is like what is proposed in the previous section with a resource place (GPEx Totem place) where people and documentation can orient and boost the thinking of the students. The pedagogical supervisors, already quoted, and the elder students already engaged in that process, will be the human resources for project maturation. Once delineated, the project will be submitted by a student-supervisor pair to a team of experienced professors for them to discuss the content, exchange with the proposers, and finally validate the robust proposals, including the list of courses removed.

Create Multidisciplinary Learning Lab collaborative projects based on the Digital Learning Lab model: For this third tool, project teams, composed of a group of students from several disciplines, supervised by a researcher / PhD student pair, will work for six months on subjects carried by research laboratories or industrial R&D departments. During this period, punctuated by 3 highlights with a final challenge, participants will have access to online modules and to the "sprint week", an intensive week of thematic seminars / workshops by researchers and of group work accompanied by experts. The model will be extended internationally by the support of ATHENA network with subjects and with students coming from foreign universities.

2.3.2 Development of HSS and digital scientific approaches in an integrated training/research approach for the benefit of research students and their supervisors

In addition to integration of HSS and Digital in training programs (2.2), the objective here is to set up transverse projects for students enrolled in our Master and Doctorate programs. Briefly, we will develop interdisciplinary research projects, seminars and annual interdisciplinary conferences mobilizing skills from research students and researchers/teachers in HSS, and in the two new poles, within the framework of the excellence graduate track. In addition, multidisciplinary research internships will be offered in close relation with the development of these interdisciplinary projects

MINERVE

Call for proposals – 2021
Appel à projets vague 2
EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (**ExcellencES**)

Document de soumission / *Submission form*

(*e.g.,* history and materials, languages and informatics, ethics, and health/cosmetics). They will be linked to the given research track Masters or Doctorate programs and will be hosted by the research groups involved in the project.

Supporting research teams and students in their interdisciplinary projects with a strategic digital component: The interdisciplinary (data science/application field) projects proposed to students will come from the research of our teams as well as from our industrial partners. A group of pedagogical engineers will be in charge of centralising the offer of projects, training students in project management and organising events. The objective is to create a dynamic of collaboration between students from different disciplines, to encourage these students to participate in hackathons, competitions and to choose equipment according to the requirements of the projects. We consider that a good part of the projects will be supervised by doctoral students, who will be able to propose topics based on their research. Recall that all projects are open to the whole ATHENA consortium. Three years after the start of the project, a chair will be proposed in order to recruit a very high-level person to strengthen the strategic vision of the organisation of interdisciplinary research in data science.

2.3.3 Support for the creation of a laboratory for the "Sciences of Sport, Physical Activity and Rehabilitation" graduate program

To support the development of a dynamic environment of research and to bring together different researchers interested in the study of human movement and health (i.e., sport, physical activity, rehabilitation, ergonomics), UO will create a new lab: SPARM (**Sport, Physical Activity, Rehabilitation and Movement for Performance and health**). This new lab will promote research within a multidisciplinary perspective (e.g., biology, physiology, biomechanics, psychology, physical therapy, sociology), which will develop and increase the visibility of our research at regional, national and international levels. The role and impact of the new laboratory in the mid-long term will be to support and contribute to the successful development of the Postgraduate Program of the new pole at educational and research levels. In addition, SPARM laboratory will play a significant role in assembling and developing research as well as disseminating knowledge and training professionals within the field of human movement and health in CVL Region.

The project is divided in two different phases. The first phase (5 years; research federation) is to cultivate a favourable environment that encourages collaborative research amongst 18 researchers within the area of human movement and health. The second phase (5 years; research lab) is to consolidate the new research lab by both developing further the research topics studied and by gathering/recruiting other researchers.

2.4 NEW CAPACITIES TO DEVELOP « LEARNING BY DOING » AT ORLÉANS UNIVERSITY: X.LABS

X.LABS will gather new educational platforms (FABLAB, MOTORLAB, SIMLAB, WEBLAB, GEODATALAB) and existing ones (FACLAB, WeLab Cosmetic) to articulate an innovative set of capacities which goal is to integrate 'learning by doing' approach in bachelor's and master's degrees, but also at doctoral level. X.LABs will be networked with similar structures in the ATHENA consortium, such as the Porto Design Factory and the Vilnius Tech "maker space". These capacities will be promoted for students and teachers to seize these opportunities.

MINERVE

Call for proposals – 2021
Appel à projets vague 2
EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (EXCELLENCES)

Document de soumission / *Submission form*

2.4.1 FABLAB – MOTORLAB – FACLAB

The first action is to physically set up a laboratory allowing "learning by doing": **FABLAB – MOTORLAB – FACLAB**, in conjunction with the teaching teams and the research laboratories. In this physical place, we will carry out scientific (technical) projects with the FABLAB, educational projects (digital tools) with the **FACLAB**, and scientific experimentation in sport sciences, physiotherapy and psychomotricity with the **MOTORLAB**. The conception of the three X.LABS will be supervised by an engineer under the supervision of the steering committee (SC). These three X.LABS (and the **SIMLAB**) will be located at the same place, in new rooms to be furnished in the premises of the UO. The engineer will oversee the preparation of the new premises, from the conception to the installation including the choice and the acquisition of dedicated furniture and equipment. Those X.LABS will be collaborating with the people in charge of the existing Fablabs within the different schools of the UO , and for the **FACLAB**, with the team of UT, which already has set up three Fac'labs. The SC will oversee the interaction with the different pedagogic units of the different schools of the two universities to promote the structure, propose new courses, help those teams to incorporate new teaching in their educational model. The **FABLAB** will also be open to public (elementary schools) during special events to promote the "fablab spirit".

2.4.2 SIMLAB

The second action is the development of a new educational tool that is strongly coupled with the research work of researchers and teacher-researchers from the laboratories of the Grand Campus and partners (UT, BRGM, INRAe, companies). It will allow students at both universities to deepen their knowledge using modern and innovative tools such as virtual fieldtrips, virtual scientific experiences and simulations, virtual archaeological excavations, etc., in VR / AR with or without scenarios, and with or without serious games. This **SIMLAB** consists in rooms equipped for VR and will be physically attached to the previous X.LABS. The engineer in pedagogy who will be recruited in the context of the project will be the interface between the different teams of the university (IT, pedagogic teams, partner teams, LearningLab) and the scientific laboratories. This person and the SC will oversee the preparation of the new premises and the acquisition of equipment and furniture.

2.4.3 WEBLAB

The **WEBLAB** is an innovative educational platform using new digital capacities (360, 4K, VR, AR) on a personal computer, using experiments, tools and objects of study coming from the research teams of the laboratories of our consortium. It will be a digital platform shared by the two Universities. It will also use collections from project partners (BRGM / INRAe in particular) and aims also at being implemented into national and international virtual collections in some scientific disciplines, such as chemistry, biology, palaeontology, geography, geology, archaeology, etc. The virtual collections will be open to public and other academic structures since we also aim at incorporating external collections into **WEBLAB**. **WEBLAB** aims at being incorporated and/or related to the existing educational platforms. The educational engineer who will be recruited in the framework of the X.LABS platforms will manage those virtual collections and the educational platform.

MINERVE

Call for proposals – 2021
Appel à projets vague 2
EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (**EXCELLENCES**)

Document de soumission / *Submission form*

2.4.4   GEODATALAB

The ambition is to create a unique site where teaching, research and development projects and start-up companies coexist. This place will be animated by a consortium composed of BRGM, INRAE, UO, CNRS and companies from the technological cluster DREAM and the incubator Lab'O. The education component is dedicated to master and PhD students in Earth and environmental sciences and ICT scientists. The **GEODATALAB** will also be the place for practical teaching for the **new master GEODATA**, proposed by UO for the start of the academic year 2024 and dedicated to the formation of data scientists and analysts in Earth and environmental sciences. This structure aims at accelerating the regional dynamics of R&D on digital development linked to environmental and geoscience issues. It will provide a workspace (digital-environment- geosciences) with privileged access to geo-databases of BRGM and INRAe. It will also stimulate exchanges between public research establishments, businesses and students through master R&D projects. The **GEODATALAB**, will be part of the X.LABS component through a shared piloting structure. The GEODATALAB will be financed by funds from local authorities and BRGM for building and premises; only the computers dedicated to students are requested in this project.

2.5   NEW CAPACITIES TO DEVELOP PARTNERSHIPS, INTEGRATION AND COMMUNICATION: CREATION OF A DEDICATED SUPPORT UNIT

The dedicated support unit called *PIC* (**Partnership, Integration & Communication**) has a crucial role on the synergy of the main **innovative activities** that are created within the MINERVE Project: this structure will participate in the culture shift of the UO Common services by promoting a new integrated collaborative approach with students, teachers, and researchers. Thanks to this new higher education management tool, an efficient system is designed to play a major role in the reengineering of UO training offer through the GPEx programm. The main features of the PIC unit are also to offer **an optimized environment to power our student's autonomy, creativity skills for innovative projects**. The PIC office will also help to facilitate **partner's communication and administration** through new information systems and will serve for the internal/external scientific exhibitions such as **symposia and workshops** at the **Technopole Area and Hotel Dupanloup** in Tours or Orleans. The **PIC unit** flowchart is based on three main services:

- **Partnership service** serves to the management of students (from undergraduate to doctoral students) projects and internship agreements that includes academic partners and industries with emphasis on an **efficient and smooth collaboration**. The whole MINERVE sphere actors will benefit from this capacity. A key action will be to promote the students' projects through scientific dissemination and mediation actions.

- **Integration service** will play a major role for the success of the internal/external interactions and exchanges as well as in the success of research and technology projects. Under the supervision of the project committee, this service will favor students and teachers/researchers interaction in laboratories as well as in the industry partners namely with the help of internal university services like SEFCO (Continuing Training Department) and government organization in CVL Region such as CFA (Apprenticeship Training Centre). Such service will foster the development of partnerships between laboratories and companies.

- **Communication service** will thus support the student intensive activities through symposia, workshops, poster actions, via accessible numerical database for the dissemination of their main

		MINERVE

Call for proposals – 2021
Appel à projets vague 2
EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (**ExcellencES**)

Document de soumission / *Submission form*

results. To reach more learners, especially in secondary education, a mobile system (bus or mobile tent) dedicated to promote GPEx training offer and scientific mediation will be set up.

2.6 NEW CAPACITIES FOR THE INTERNATIONALIZATION OF THE TRAINING OFFER

Internationalization and a recognizable, visible university image are a necessity for any higher education institution aiming at excellency. This is particularly true when it comes to the creation of a learning environment that attracts and binds excellent students to the university. The ultimate objective is to help and support the creation and building of the brand of an international school. One of the core principles of this concept and proposal is the strong connection between research and teaching. The strong research at our university, in the exact sciences and HSS, is already demonstrating excellence and high international visibility, attracting foreign researchers, research projects and students from around the world across several different existing but dispersed study programs (double diplomas, block lectures, English-taught Bachelor and Master programmes). Based on existing teaching programmes, this MINERVE project will establish the organizational and structural requirements which are necessary to merge existing courses and new teaching activities, connecting them together with GPEx, ATHENA program, X.LABS , research units, support and help these activities. The planned conversion of existing courses into module courses in English with practical exercises and face-to-face projects with "learning by doing" principle will lead to the development of a fully-fledged English-speaking programs. The educational offer towards international partners will reflect program changes with all the transversal and multidisciplinary aspects. The starting phase will be the implementation of international summer and spring schools, to promote the idea of the UO school on an international level. Summer school is planned as a one-week activity, a week before the semester starts. The targeted participants include the last year Bachelor students (summer school) to get the flavour of the local programs and research and PhD and Master students (Spring school). Both would under umbrella of UO, Le Studium, Erasmus and ATHENA programs and supported by various international research projects.

The UO will offer English courses with recognized diploma, and to foreign students will be given the opportunity to learn or improve French. Master and PhD students in the language and economic departments will be encouraged to participate actively in the projects. It will help students to transfer their knowledge into business activities, cycle engineering or encouraging them to become entrepreneurs. The first action here is the creation of the international networks /platform for undergrad and grad students and experts. The second action is the creation of the tools to accompany interdisciplinary projects and implement ATHENA. The third action is dissemination and management, gathering teams of student led projects, organising the dissemination in France and abroad, scientific workshops, visits.

2.7 DEEP TRANSFORMATION OF ORLÉANS UNIVERSITY ORGANIZATION AND CULTURE: GOVERNANCE, EDUCATION AND RESEARCH, COMMON SERVICES

The PIA4 project will be an opportunity to accelerate the transformation of the university, first in the governance domain. **The steering committee of the MINERVE project and the International and regional advisory board will be perpetuated after the end of the project and will result in the creation of the "University of Orléans Partners committee"**. Its function will

MINERVE

Call for proposals – 2021
Appel à projets vague 2
EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (**ExcellencES**)

Document de soumission / *Submission form*

be to strengthen the involvement of regional, national, and international partners in the development of the university and to support students, teachers and researchers in partnering with public and private actors in research and innovation. Culture of partnership will be strengthened at UO thanks to the change management plan that will accompany the deployment of the PIA4 project: actions will be set up to develop the partnership culture of students and professors.

The project committee will be the first step in the development of a transversal educational engineering service for all the university's components. It will be made up of a group of senior program directors dedicated full-time to this function and seven work package managers dedicated half-time to this function, all of whom will be appointed and mandated by the university president from among personalities with proven leadership in the transformation of the university: (i) a work package leader will be appointed for the implementation of the graduate program in "Science and Technology enhanced by Data Science", (ii) a work package leader for the implementation of the graduate program in "Sciences of Sport, Physical Activity and Rehabilitation ", (iii) a work package leader for the implementation of the strengthening of training and research in the digital field, (iv) a work package leader manager for the implementation of the reinforcement of training and research in the humanities and social sciences, (v)a work package leader for the transformation of common services in the areas of partnerships, insertion and communication, a (vi) a work package leader for the transformation of services in the internationalization of training and research activities, (vii) a work package manager for the federation and the development of pedagogical platforms in learning by doing. A task force of learning engineers (The Learning Design Task Force) will be recruited as part of the PIA4 project to assist the project committee in implementing transformation plans that will allow for the implementation of GPEx model with the pedagogical and research teams. A dedicated task force will reinforce the existing Learning Lab team, whose mission is to conduct a change management plan for professors in innovative pedagogy and supervision of young researchers. The PIA4 project committee is foreshadowing the creation of a position of deputy director general of services whose mission will be to lead the transformation of all university's training programs to bring them into line with the new training standard developed as part of the PIA4 MINERVE project.

In the field of education and research, two new poles will be created: an education pole dedicated to the sciences and techniques associated with artificial intelligence and data, and an education pole dedicated to the sciences of sport, physical activity, and rehabilitation. The first pole will be linked to the university's laboratory networks in these fields. In the field of sciences of sport, physical activity and rehabilitation, a research federation will be created and will give birth after five years to a new laboratory: (**Sport, Physical Activity, Rehabilitation and Movement for performance and health (SPARM)**. These two educational units, which are close to the laboratories mentioned, will form two graduated programs. These first two graduate programs, which will be delivered after five years, will serve as a model for the reengineering of others university's training programs, which should be completed after 10 years.

In the area of common services, capacities and teams that had been developed in the education poles in the areas of communication, partnerships, insertion, scientific mediation, and international relations will be reintegrated into the university's common services as dedicated task force to support GPEx implementation. But the culture and the specific posture of these agents, who were

MINERVE

Call for proposals – 2021
Appel à projets vague 2
EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (EXCELLENCES)

Document de soumission / *Submission form*

close to the pedagogical and research teams and who were integrated into their project, to respond as well as possible to the needs of the students, will have to be generalized to the whole of the common services. This generalization of this co-design culture will be carried out within the change management plan that will accompany the PIA4 project.

3   *PILOTAGE ET PARTENARIAT/ MANAGEMENT FRAMEWORK*

Figure 2: Governance of MINERVE PIA4 project
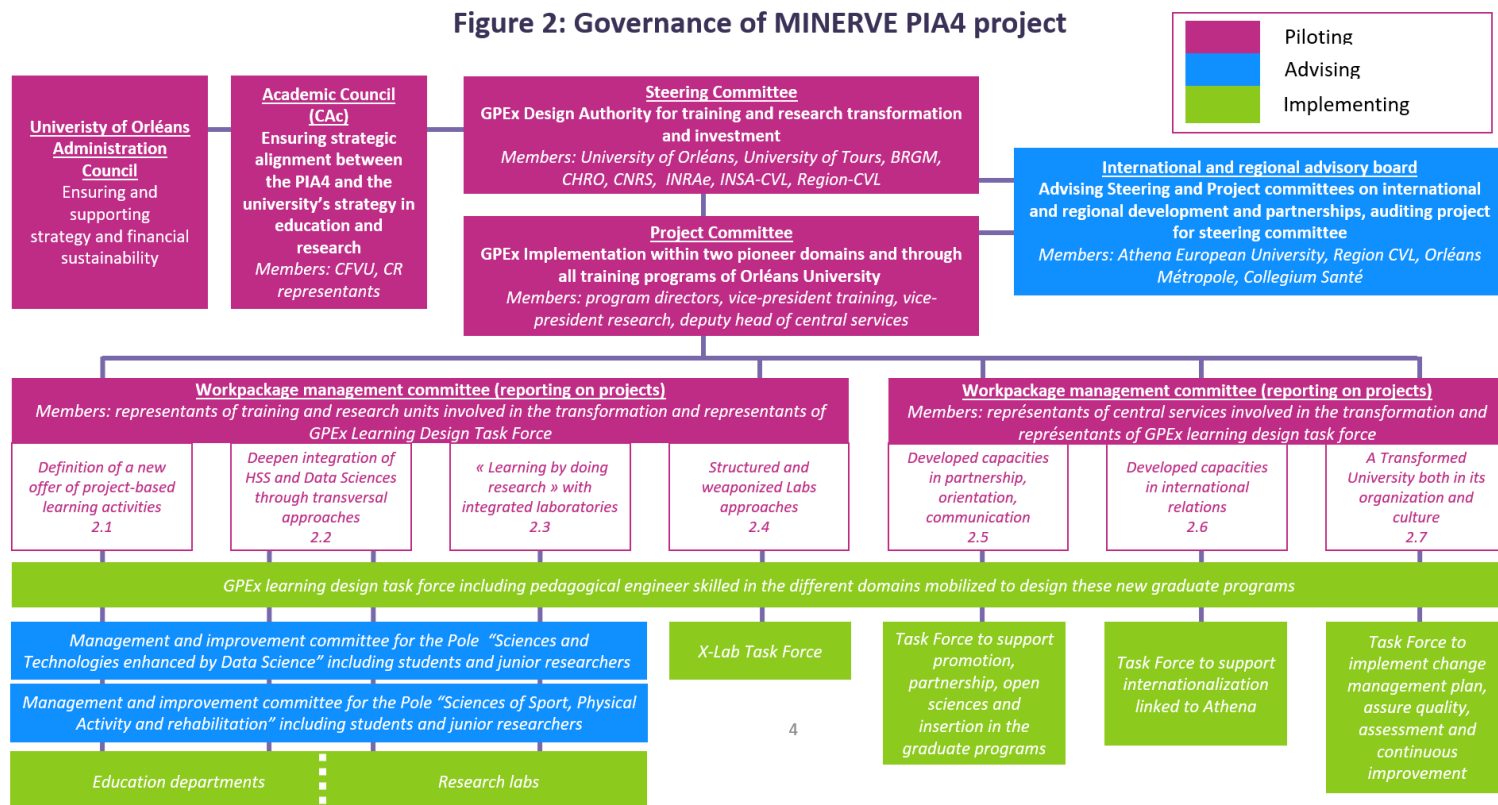
The governance and steering mechanisms created for the PIA4 MINERVE project are closely linked to the current university's governance (Academic Council and Administrative Council, to ensure strategic alignment), while being partnership-based. **The PIA4 project steering committee** includes the university presidency and the main partners of the PIA4 project: University of Tours, BRGM, CHRO, CNRS, INRAe, INSA-CVL, CVL-Region. The steering committee makes all the decision regarding project orientations, fund allocations, strategic risks mitigations, and it receives reports every quarter from the "Steering, Prospective, and Continuous Improvement Direction" (DPPA) which ensure that necessary processes are established to monitor the implementation rate. DPPA is also in charge of the quality of data relating to the PIA projects and the follow-up of MINERVE's key performance indicators, (some already existing will be calibrating for the project assessment). The six main KPI for the PIA4 project are (i) the graduation and the apprenticeship rates, (i) the regional, national, international attractiveness of the GPEx programs (enrolment data analysis), (iii) the insertion rate of students from these programs (including insertion in UO labs), (iv) the number, quality and financial engagement of targeted partners (specific indicator for each graduate program created by the DDPA with assistance of the PIC department), (v) the number of transdisciplinary research projects and (vi) a specific indicator the "Satisfaction Score of Students and Professors Involved in Minerve" (3SPIM) that will be calculated every six months through a

MINERVE

Call for proposals – 2021
Appel à projets vague 2
EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (EXCELLENCES)

Document de soumission / *Submission form*

simple online surveys to measure the adequacy of both training offer proposed to students and pedagogical design capabilities provided to teachers. Targets for these indicators will be defined during the preparation of the consortium agreement. The steering committee gather twice a year.

The project committee reports to the steering committee. Members of the project committee are the senior program directors, the VP training, the VP research and the deputy head of central services. The project committee gather once a month. Two **work package management committees** will gather on a weekly base (complying with agile project management methodology) to monitor closely the implementation of every action: one dedicated to education, research and pedagogical innovation (platforms), another dedicated to central services transformation.

The international and regional advisory board will be mandated by the steering committee or the DDPA to audit the project management in terms of international and regional impact. This board will also advise the project committee to reach MINERVE goals in this domain. The board gather once a year.

The two new education poles, that is "Sciences and technologies enhanced by Data Science" and "Sciences of sport, physical activity and rehabilitation" will be managed by an education director and benefit from advise of a **"Management and Improvement Committee" (MIC),** which will include students enrolled in the graduate program, teachers of the program, representatives of laboratories that support teaching and research linked to the graduate program, representatives of both taskforce (PIC and internationalization), international partners (ATHENA network of European universities), and industrial partners of the field (companies employing students graduating from this program). A continuous improvement process will participate in the engineering and re-engineering of the courses with the assistance of the Learning Design Task Force and the Learning Lab, this process will be monitored by the MIC. During the GPEx implementation phase, the education director of both axis report to the project committee. Then standard UO governance for education unit will be applied.

4 JUSTIFICATION DES MOYENS DEMANDES / FUNDING JUSTIFICATION

The PIA4 ANR funding will make it possible for the university to accelerate its transformation through the ten coming years. Orléans University transformation project amount to 131,1 M€ until 2031 (including 17.3 M€ grant): 82,7 M€ correspond to personnel costs (including 10 M€ grant), 4.2 M€ correspond to operating costs (including 4.0 M€ grant), 2.0 M€ correspond to equipment costs (including 2.0 M€ grant) and 1.3 M€ correspond to the project management costs. Cost regarding pedagogical engineering capacities development will be important during the "reengineering phase" due to the alignment of the existing courses with the new standard but will decrease afterwards making it possible for UO to cover personnel costs after ten years. Change management plan implemented for ten years will develop autonomy of teachers in reengineering UO training offer after 2031. The additional human resources needed regarding "common services renewal" for the (i) PIC department, (ii) the internationalization department, and (iii) the HR department (change management) will be covered by the university after 2031 through the redeployment of three profiles. The development of apprenticeship and related taxes collection will be allocated to the operating costs of the PIC department. The costs related to the creation of the SPARM laboratory will be covered by the ANR funding during the first five years (federation phase) but at halfway of the PIA4 project, the university will cover all costs for its new laboratory.

MINERVE

Call for proposals – 2021
Appel à projets vague 2
EXCELLENCE SOUS TOUTES SES FORMES –
EXCELLENCE IN ALL ITS FORMS (**EXCELLENCES**)

Document de soumission / *Submission form*

Costs related to the equipment, maintenance and facilitation of the pedagogical platforms will be covered by the university after 2031 by the recruitment of a dedicated technical engineer and thanks to partnership development (companies, Region CVL (CPER) and European investments (FEDER), entities dedicated to innovation and entrepreneurship development covering a part of the operational costs). These platforms will also be shared with Tours University for developing uses and covering costs.

The fund allocation principles will be confirmed in the consortium agreement. Orléans University's presidency, complying with the specific governance of the PIA4 project, will validate the best fund allocation scheme with its partners gathered in the steering committee. Funds will be engaged according to the macro planning below.

Figure 3: Planning of MINERVE PIA4 project