Quality report of the *Erasmus+ Capacity building* project MONTUS

Final Quality Report

10.11.2022

We present here the second report of the self-assessments and self-diagnoses of the institutions in 2022, according to the format of the 6 collectively agreed axes of the reference document "Quality Assurance Plan". The final evaluation by an external firm was optional and could not be carried out due to the lack of funds available on the subcontracting budget line for the partners who were in charge (HAU and NLU). Thus, the final quality report is based on the terms of reference and the six self-diagnostic axes defined in the interim report, and on the synthesis of all the questionnaires completed after the workshops.

On the **partnership logic** axis **within the network**, the synthetic analysis shows a total adhesion to this multinational and multidisciplinary project. The interactions with the social demand in the field of environment and applied geosciences have been numerous. The network has concretely expanded towards other faculties, universities, and companies. This process is more marked in the three institutions with CLOUD infrastructure, namely ITC, AIT, and VNU. The partnership logic is considered to be respected, and compliance with bilateral agreements and the grant agreement is proven.

The synthetic analysis of the **project cycle, from start to finish,** shows many changes due to the following factors: a. Contextual changes at VNU, b. COVID pandemic, c. Change of coordinator at UT2J. However, adjustments and corrective measures were systematically found, in consultation with the EACEA and the project Steering Committee, to readjust: a. The workshop agenda, b. The INSIGHT Master's course. The year in which the borders were closed obliged the teams to meet monthly online via zoom, and these regular consultation times of about 2 hours benefited the project and consolidated the exchanges: this mobilized the partners more, who also had to communicate internally in their institutions about the project, and were able to mobilize other departments and faculties.

Regarding the **steering and the valorisation of the project**, the committee in charge with a representation of each institution and the project leader assigned specific production tasks to the different working groups and workshops. The procedure appeared to be adequate until the end, the functions and responsibilities being clearly defined from the start. The new scientific coordinator of the project was able to assume her role and was respected from the start. The question of internal management in the institutions is much more heterogeneous: the partner institutions are more or less used to project management, do not necessarily have an international relations office competent in project management, and/or have opaque financial and accounting structures. The lack of administrative staff accompanying the teachers is a major difficulty: even if an administrative referent was found in each school, the teachers involved were often responsible for the administrative and financial aspects of the project. All of them declared that they had learned about project management, although this activity was time-consuming in the institutions with the least support from their project support services.

The valorization of the project is based on the online publication of pedagogical resources from 14 detailed contents of the teaching units of the master: the H5P format, innovative and learner-oriented,

facilitates the integration and the reuse of the resources in learning platforms. The project's website greatly favors its visibility by publishing all the contents of the pedagogical resources and the resources used during the different workshops. They were thus easily relayed to the socio-economic environment and the university communities involved, through the institutionnal websites also.

As far as project management is concerned, 98% of the beneficiaries declare that they have increased their skills in managing an Erasmus + project, and are already trying to develop other Erasmus + projects in the same field.

The creation of the master's degree, the aim of the project, came up against the usual difficulties of accreditation in Vietnam. The model was discussed and validated collectively. The backing of the initial INSIGHT master's degree to a new master's degree created at VNU in civil engineering was collectively approved and supported by all the partner teams. All of them underline the relevance of the pedagogical program, its multidisciplinary opening, and its adaptability. Regarding the Master's degree, 95% felt that the topics covered by the syllabus were relevant, and showed great interest in writing and revising the pedagogical content. Some suggested additional topics to be developed in the future, such as blockchain and its applications, environmental management, technical conferences. 100% of the beneficiaries declare that they have made the published pedagogical resources known internally and disseminated them to their network (students, colleagues, researchers). The master is intrinsically multidisciplinary, including topics in mathematics, geoscience, physics, urban planning and computer science. The Master program, offered in Hanoi-Vietnam as the result of MONTUS, provides synergy to the on-going master programs on cloud computing but also on artificial intelligence (AI) at a regional level. The master will contribute to regional academic of Southeast Asia by providing a knowledge sharing platform and skills of new technology to manage effectively the environmental issues.

The **mobilization of resources and complementary financing** shows a strong involvement of the personnel and a local availability of scientific data adapted to the project. In spite of the different management cultures, the administration of the project worked well overall, with a treatment adapted to the circumstances. Cross-financing with other projects allowed for economies of scale in the "internationalized" institutions. As for the "small" institutions, they were able to mobilize their services for MONTUS.

Regarding the impact at the institutional level, the commitment of human resources is emphasized; between 4 and 25 people are involved in the project depending on the institution, the strongest involvement being associated with the Southeast Asian universities in charge of the *Cloud Computing* equipment. These universities are developing synergies in the national workspace. In the end, the result is a better visibility on a regional and international scale, and a better geopolitical opening. The workshops and training sessions were opens to public and private sector. The master program aims to recruit learners from public sector and private sector. 85% of the participants from the beneficiary institutions consider that this E+ project was an excellent experience, and 100% will recommend to their colleagues and networks to get involved in such an Erasmus + project because of a notable increase in competence and institutional and scientific capacity building on an individual and local level: all note that they have already begun to reinvest the skills and knowledge they have acquired in their professional environment within their departments, such as project management, CC, big data case studies, GIS, educational resource production, remote sensing, and data in environmental science. All of the participants will apply or apply some of the tools developed in MONTUS, also applied to

innovation in research: they all feel that the workshop has strengthened their willingness to learn new skills. Moreover, the hardware and software equipment acquired in TORUS and MONTUS projects will be effectively used in the master and beyond. All the partners in Asia have increased their CC skills but have also discovered the interest of High Performance Computing (by the installation of the equipment in ITC) for environmental sciences. Most of them now wish to develop new courses on these topics in connection with the rise of deep learning and AI.

To maximize the impact of the project, some partners have already put in place an action plan: 1) involve more young colleagues to work on case studies with senior international colleagues, 2) involve doctoral research, 3) organize face-to-face meetings to disseminate and valorize the results internally in their institutions, and 4) develop more workshops for the exchange of good practices in an interdisciplinary approach.

At the end, on the basis of the institutions' self-assessments and self-diagnoses, the descriptors place the project in line with the initial objectives, and confirm the relevance of the proposal and its coherence.

MONTUS' results at the end of the project confirm that:

1. Relevance of the Civil Engineering master in the context of SEA is relatively high: students trained by this master will acquire expertise and skills in new technologies that will improve their employability and professional integration

2. Capacity building between environmental sciences and IT in the field of CC.

3. MONTUS perpetuates the intellectual and material investments of TORUS while bringing new supports to higher education and research and reinforcing the computer parks dedicated to the CC.

4. To associate Research with MONTUS with ongoing requests to consular and national authorities for thesis. This is an essential enhancement for the perpetuation of the master's degree to benefit from future teachers in the field.