RE-DWELL
MSCA-ITN

RE-DWELL Blended-learning methodology and tools

Deliverables 2.1-2.2

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RE-DWELL

Deliverable 2.1. RE-DWELL Blended-learning methodology and tools (stage 1)

Deliverable 2.2 RE-DWELL Blended-learning methodology and tools (stage 2)

Version 1

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Executive summary

This report summarises the work carried out in Task 2.1 "Online learning platform", dedicated to the creation of a blended learning environment to implement a programme of online and face-to-face activities.

During the first year of the project, the beneficiaries examined various technological solutions to support the online learning and teamwork activities, including open software, proprietary platforms facilitated by third parties, and platforms developed by the participating institutions. After assessing the functionalities of the different options, the decision was to use MS Teams because:

- it has a generic, flexible and versatile structure made of teams, channels and associated shared file systems.

- it can combine structured learning and teaching while supporting the collaborative work of groups of students and supervisors; the two main goals of the RE-DWELL learning environment.

- it can be combined with other tools, such as Miro.

- it was not necessary to purchase licenses since most beneficiaries already had access to it.

In addition, and to facilitate networking between individual research projects and the building of a shared knowledge base, a glossary and a case study library, both of which are available on the project website, have been specifically created to support collaborative research.

A blended-learning methodology using the selected technologies which were applied in the training and network activities, was progressively introduced as the programme developed. A blended learning model is intrinsic to the nature of RE-DWELL. PhD students and supervisors based at 10 universities require a learning space tailored to the specific needs of the programme. As foreseen in the work programme, face-to-face meetings take place every 3-4 months. In the intervening periods, students and faculty need to continue to work together on course assignments, in different ways (independent work, teamwork). Thus, the courses have been planned and implemented to be delivered as a combination of online and face-to-face sessions that take place in the workshops and summer schools.

Finally, a table of learning outcomes tailored to RE-DWELL’s training and research activities is included in the Annex.

1. Introduction

This report summarizes the work completed in Task 2.1 “Online learning platform”, dedicated to the creation of learning environment to support collaborative learning processes across partner institutions following a blended-learning approach, with learning activities carried out online and onsite.

From March to May 2021, different solutions were examined by the consortium in order to choose the most suitable environment for the teaching and learning needs of the RE-DWELL project. The analysis included proprietary learning tools, tools hosted by partners, as well as open tools. The adopted solution was a learning environment using MS Teams with which some partners had already gained some experience, especially during the Covid-19 lockdown. This option was easily available to all partners, and included the basic features necessary to carry out the design and implementation of learning activities in a blended mode.

In parallel to the adoption of a technological solution, a methodology for blended-learning was developed and systematically applied in the courses carried out so far (RMT 1 and 2, TS 1 and 2) and intertwined with the network events (workshops in Lisbon and Budapest, summer schools in Nicosia and Valencia).

Finally, a table of learning outcomes was created to support the design and evaluation of the courses and research activities.

2. Online learning environment

The selection of the learning environment was carried out by the RE-DWELL consortium from March thru May 2021, before the start of the learning activities planned for 1 July 2021. At the outset, it was necessary to have tools for for these purposes :

- to deliver courses in a structured manner, particularly for the RMT and TS courses.

- to support team work (e.g. reviews of ESR thesis, by different supervisors)

- to keep track of the development of the ESRs’ work during the three-year programme (course, achievements, publications, etc.) through the Career Development Plan.

The following options were considered based on the previous experiences of partners:

- PebblePad, a proprietary software used in The University of Sheffield mostly by postgraduate students, it offers users the flexibility to organize the learning and research work. It can work with Atlas, a tool for structured learning (Figure 1).

- ARCLASS, an online learning environment developed by the research group ARC Engineering and Architecture La Salle, which is used at the undergraduate level and could be adapted to the needs of the Action (Figure 2). A direct link with a Career Development Plan could be created.

- TU Delft learning platform which is based on MOOCS (Open EdX). The activities are structured hierarchically and students can engage in discussions. However, it is not a tool for collaborative work. It includes a suite of tools for different learning tasks (Figure 3).

- Microsoft Teams, a proprietary business communication platform which was already used by the beneficiary institutions (Figure 4).

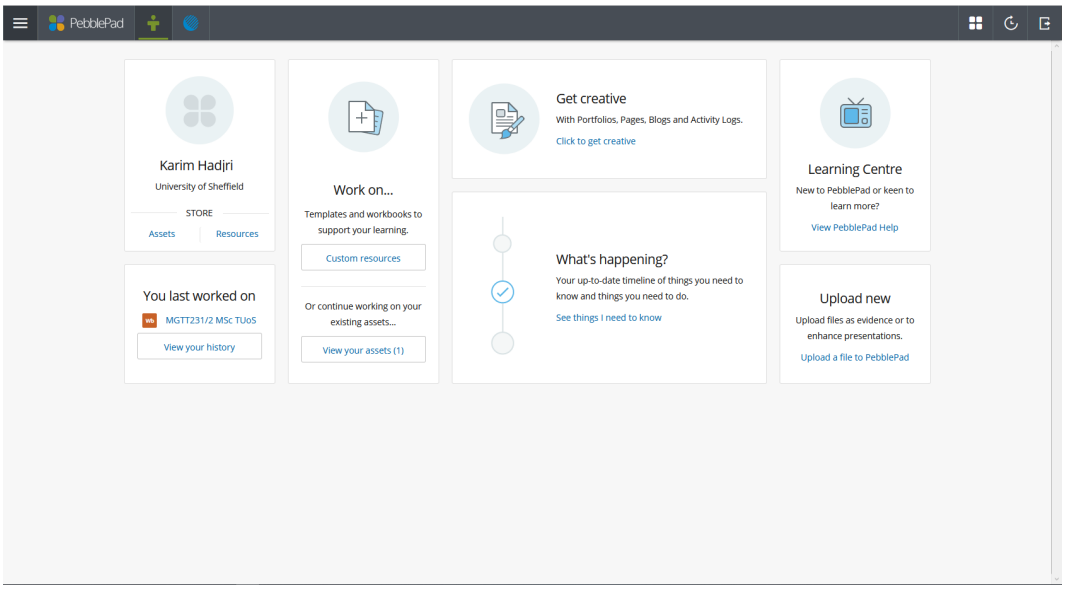

Figure 1. Configuration of PebblePad for the testing phase

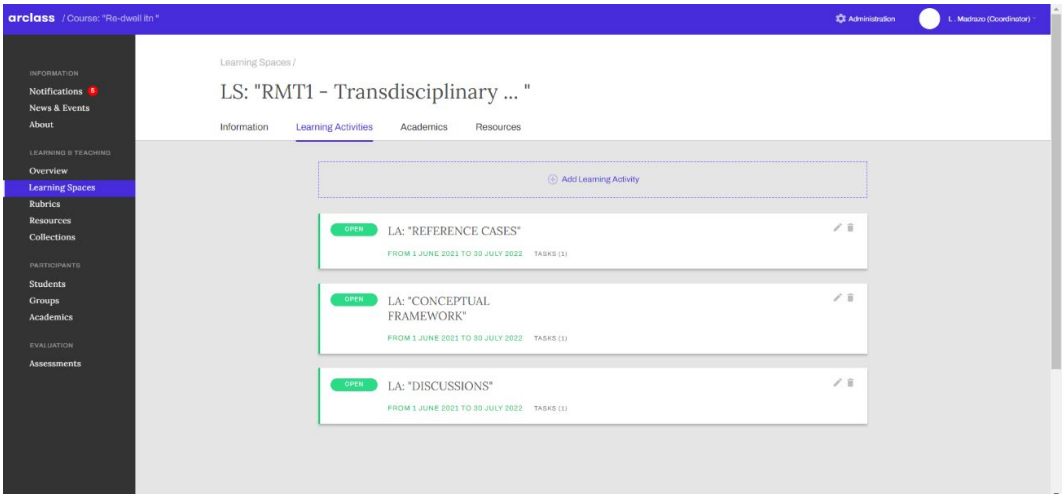

Figure 2. ARCLASS adapted to the RE-DWELL courses

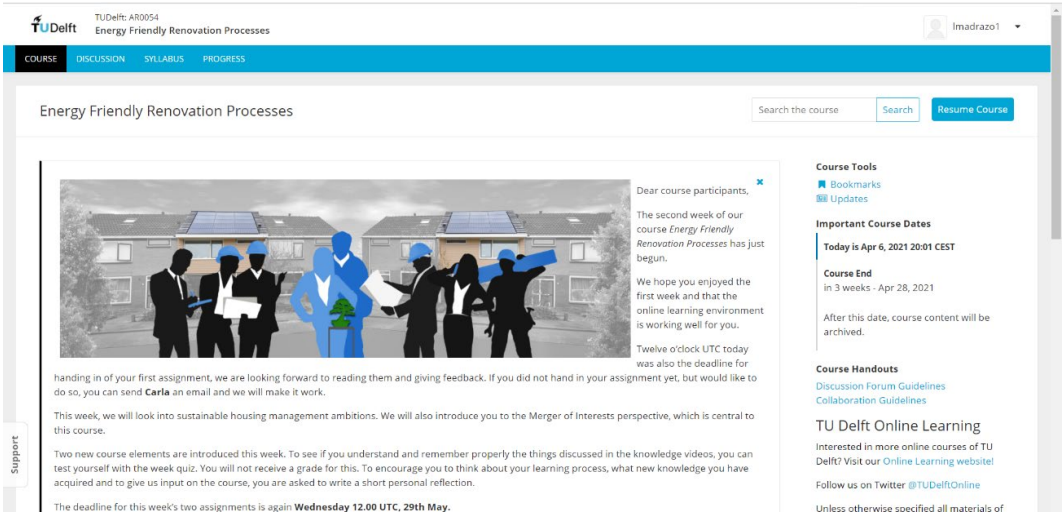

Figure 3. Example of a structured course in the TU Delft online learning environment

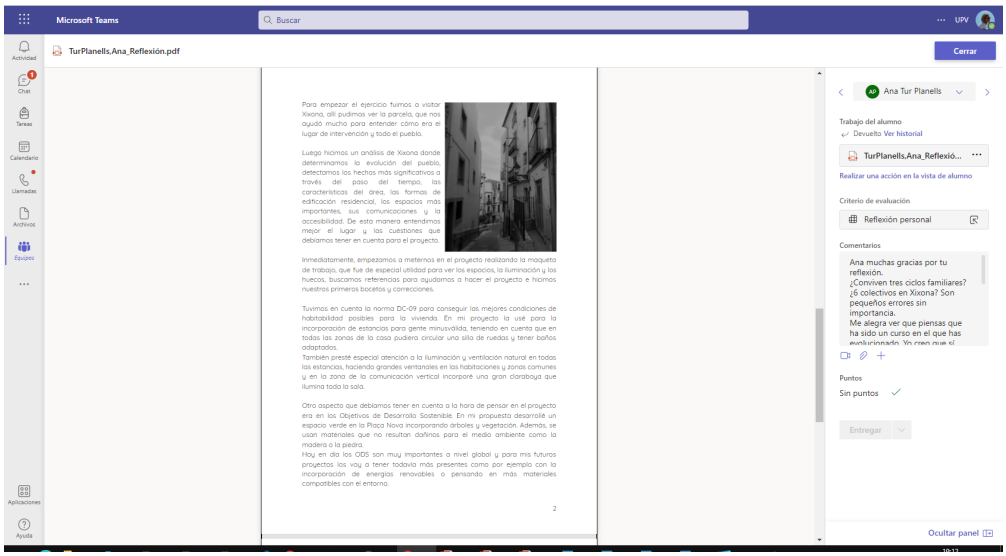

Figure 4. Example of MS Teams used to review and comment the work of student

The pros and cons of the different options were discussed by the consortium members, on the following grounds:

- It is better to concentrate all activities –structured learning, collaboration– in one place to avoid introducing the same information in different platforms.

- MS Teams is not as user-friendly as ARCLASS or PebblePad.

- ARCLASS could be used for structured learning, but it cannot support team collaboration. The development of a direct link to automatically feed the CDP from the learning environment was considered an enormous programming work which was not justified by the time savings that could be achieved.

- Having to purchase a license for a proprietary tool entails the risk of losing access to contents when the license is over; this would not happen with ARCLASS or MS Teams for which La Salle-URL already has a license. In addition, the license costs of proprietary software are dimensioned for a large number of students, namely in institutional programmes, rather than for a small learning group as it is the case in RE-DWELL.

Finally, the decision was to use MS Teams because:

- it has a generic, flexible and versatile structure made of teams, channels and associated shared file systems.

- it can combine structured learning and teaching while supporting the collaborative work of groups of students and supervisors; the two main goals of the RE-DWELL learning environment.

- it can be combined with other tools, such as Miro.

- it was not necessary to purchase licenses since most beneficiaries already had access to it.

The identified draw backs of MS Teams during the testing phase were:

- the teaching module offered many functionalities which were not needed for the planned courses (e.g. assignments, grades). Therefore, it was decided to dispense with this module and to create a structure of folders for the courses in a systematic manner.

- lack of user-friendliness of the interfaces.

3. MS Teams learning and working environment

MS Teams is hosted by the Action coordinator, La Salle-URL. Users from other institutions can access this environment by first changing the organisation to “La Salle”. The following types of Teams have been implemented (Figure 5):

- “RE-DWELLS ESRs”, to share all the information that ESRs need to carry out the their work

- “RE-DWELL RMT / TS”, for the design and implementation of the three modules of the two courses

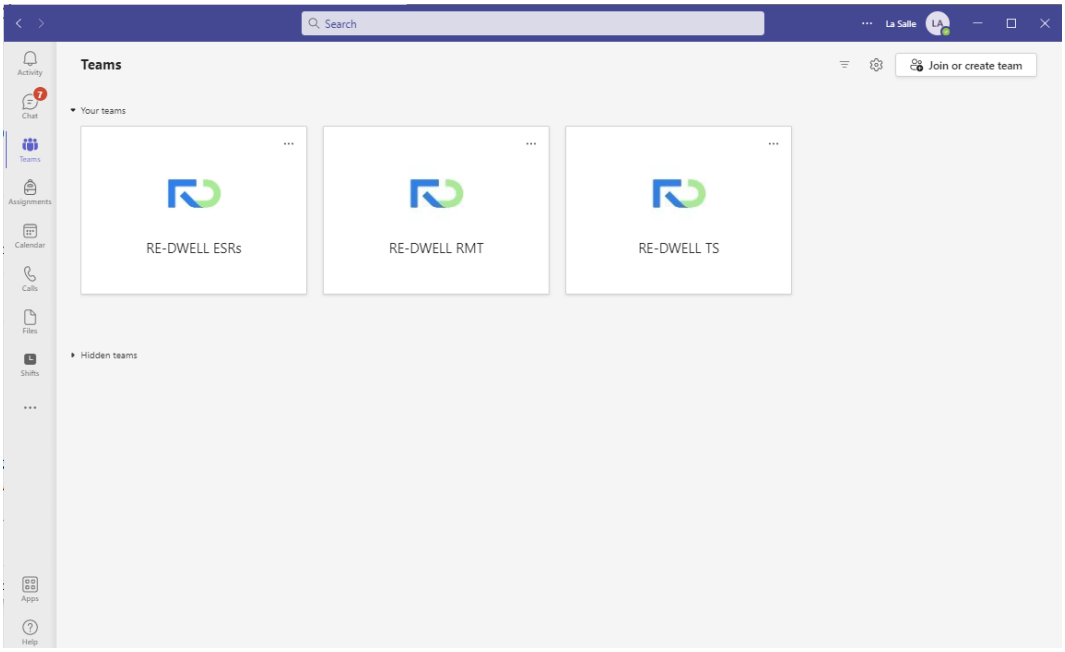

Figure 5. RE-DWELL Teams top page

3.1. Teams “RE-DWELL ESRs”

RE-DWELL ESRs is organized in different types of channels (Figure 6), each one with its corresponding Files section.

- General, for the information which is accessible to ESRs and supervisors

- RE-DWELL events, workshops, summer schools and conferences (e.g. SS1 Nicosia, SS3 Valencia...)

- EXTERNAL EVENTS, communication about conferences, seminars, etc. organized by third parties which could be of interest to the network members.

- ESR[n], for the information specific to each ESR which is only accessible to the supervisor registered in Teams.

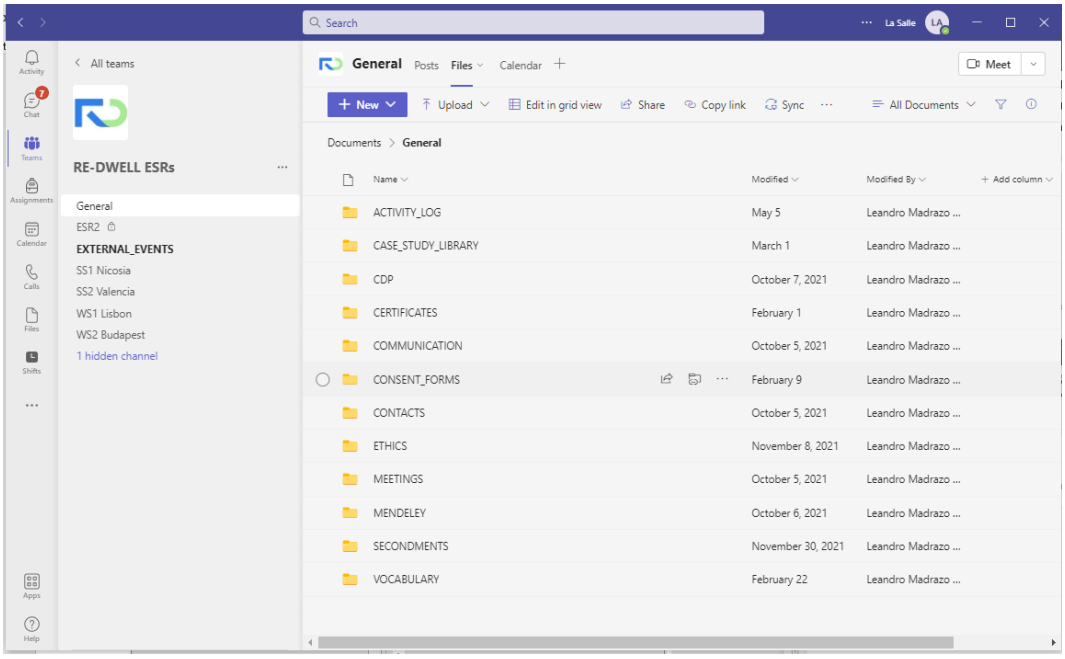

Figure 6. RE-DWELL ESRs Team: contents of the General channel

An internal calendar is used to share information about the network activities classified with labels (Figure 7).

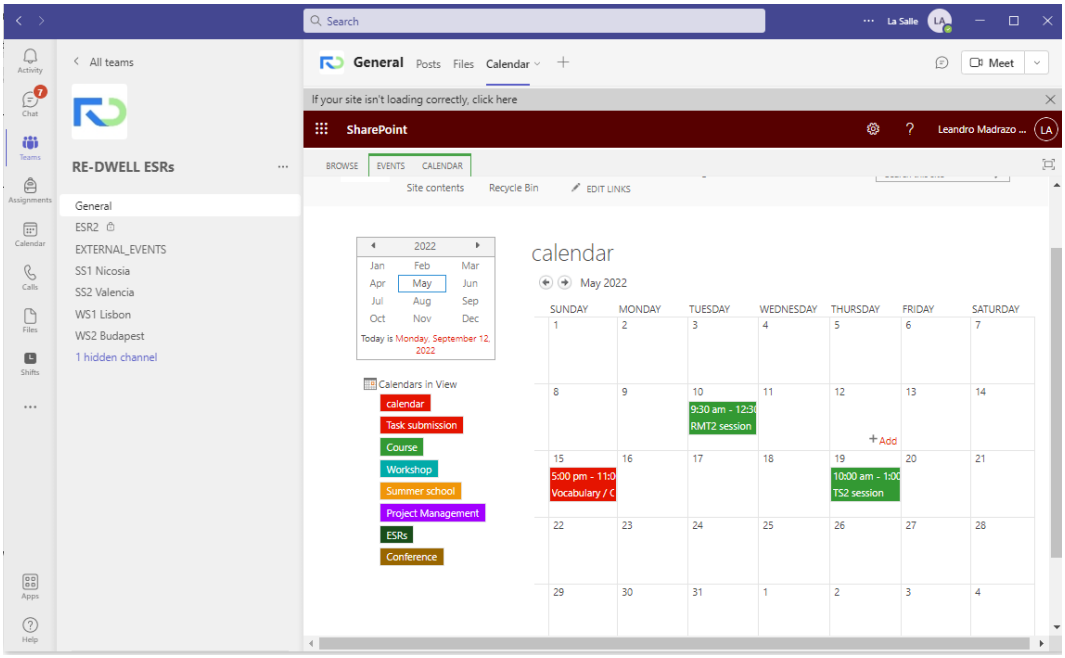

Figure 7. Calendar tool

3.1.1. Network events

Each RE-DWELL network event (workshops, summer schools) has its own channel, with a shared file system (Figure 8) and a private chat option (Figure 9). The Files folder contains the documentation related to a network event (programme, venue, travel information), session documents (presentations, works carried out by students), and the ESR reports.

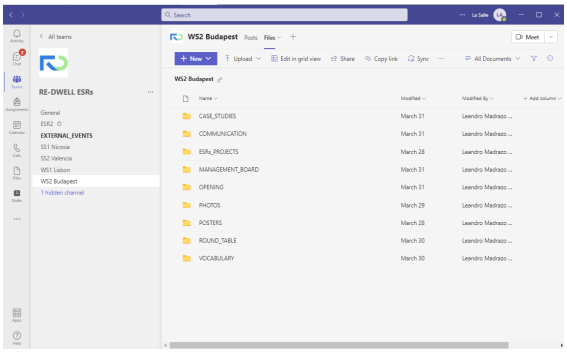

Figure 8. File shared system of the channel devoted to network events

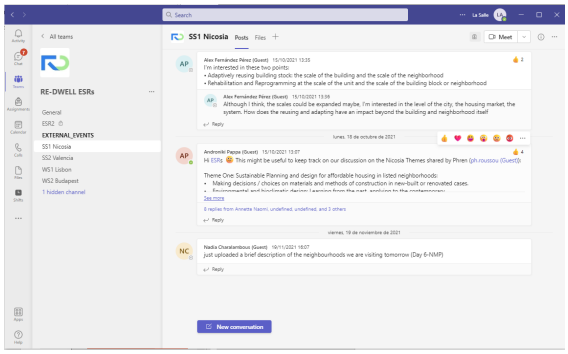

Figure 9. Chat of the channel of the network events channel

3.1.2. External events

There is a channel for ESRs and supervisors to share information about external events (conferences, workshops, etc.) by means of chat (Figure 10). The events information is shared in the chat section, and it is registered in a spreadsheet document in the Files folder.

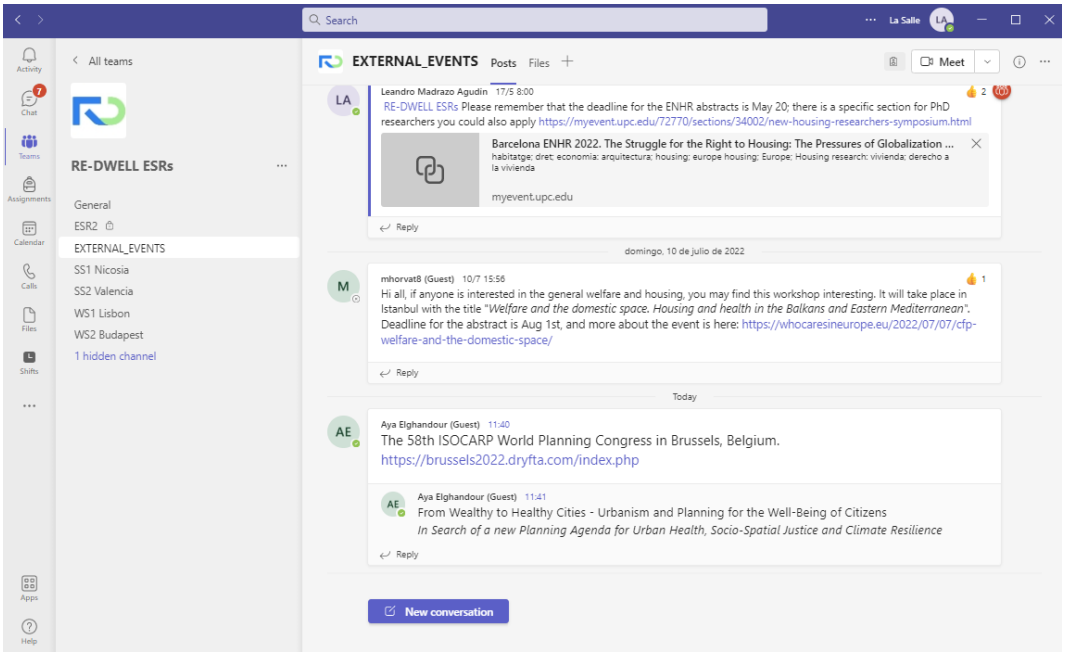

Figure 10. Chat to share information about external events.

3.2. Teams "RE-DWELL RMT / TS" courses

RMT and TS courses have their own Teams based on the learning module. However, the built-in channels of this module are not used. Instead, a file structure is created in the General channel which is the same for both courses (description, resources, tasks, sessions, assignments) and to get the assignments back from students (Figure 11). Additional ones can be created for specific course activities.

Each course has a folder to store the files needed (session description, presentations, references) (Figure 12). Within the session folder there are subfolders for the tasks carried out during the session. The Task folder contains the resources to carry out the task and a folder in which the students submit their work.

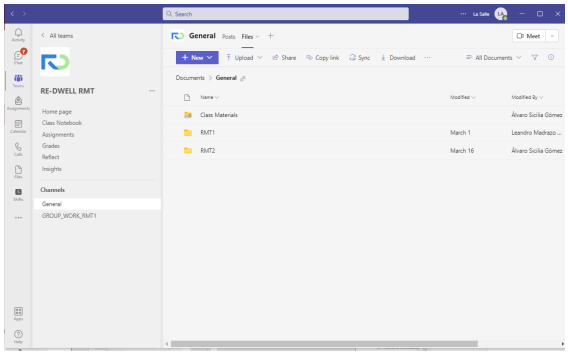

Figure 11. File structure of one of the RMT courses

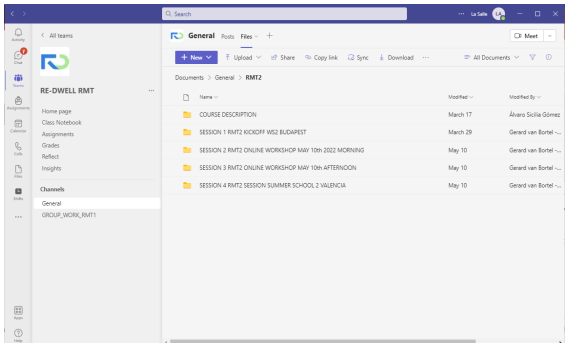

Figure 12. File structure of one of the RMT1 course

4. Blended learning methodology

Blended learning combines face-to-face with online activities that allow synchronous and/or asynchronous collaboration among learners, facilitating a community of inquiry that is constituted across institutional and physical boundaries and, at the same time, allows for multiple levels and types of instruction.

A blended learning model is intrinsic to the nature of RE-DWELL. PhD students and supervisors based at 10 universities must share a learning space tailored to the specific needs of the programme. As foreseen in the work programme, face-to-face meetings take place every 3-4 months. In the intervening periods, the group of students needs to continue to work together on assignments, in different ways (independent work, teamwork). Thus, the courses have been planned and implemented to be delivered as a combination of online and face-to-face sessions that take place in the workshops and summer schools.

From the beginning of the network learning activities, in the kick-off sessions held in July 2021, we started to apply a blended learning methodology in order to integrate:

- online and onsite activities, with courses that could start in an online or onsite session and then continue until the next online or onsite meeting.

- activities carried out in the RMT and TS courses with the individual research projects

- activities performed on the courses and individual research projects with the collaborative construction of a knowledge base at the network level (vocabulary, case study, references database).

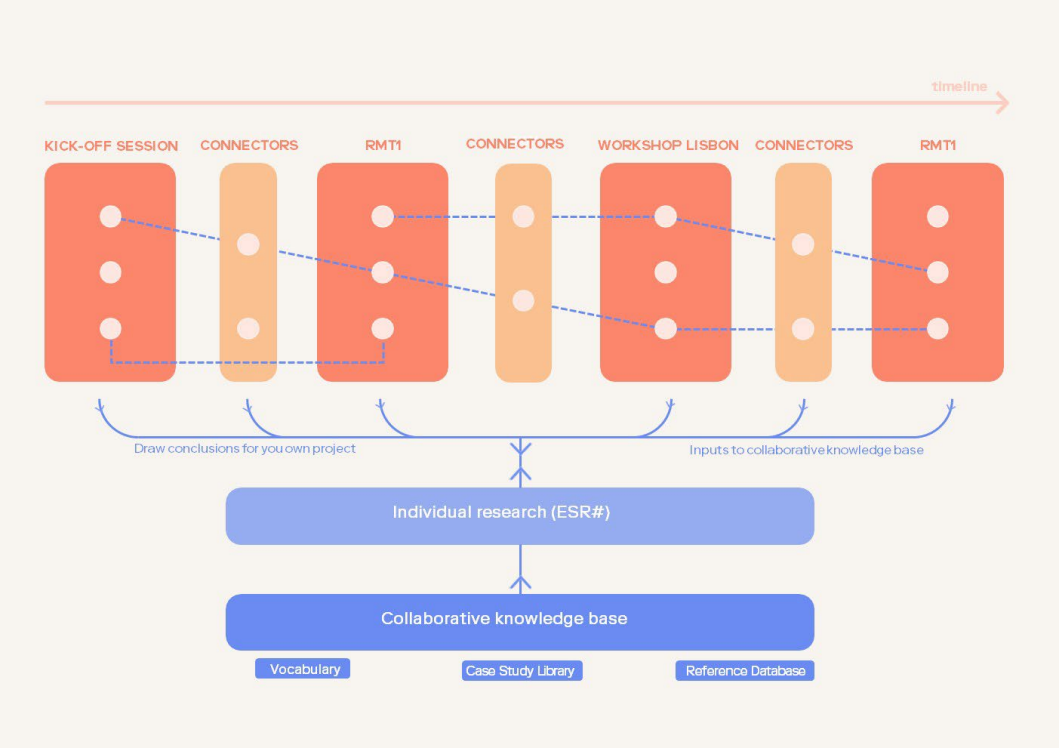

Figure 13. File structure of one of the courses

The activities carried out in between course sessions and network events act as connectors across the learning and teaching and research activities (Figure 13). For instance, a task started in the online kick off session (Figure 14): to examine the meanings of three key concepts in RE-DWELL research framework, “affordability”, “sustainability” and “transdisciplinarity”. Students working in teams discussed the meanings of the terms using a Miro board (Figure 15). After the kick-off sessions, they continued working online in teams refining the definitions which were then reviewed by the supervisors. Finally, the definitions were discussed in an onsite workshop which was part of the RMT1 course. The final step was to publish the entries in the Vocabulary website (Figure 15).

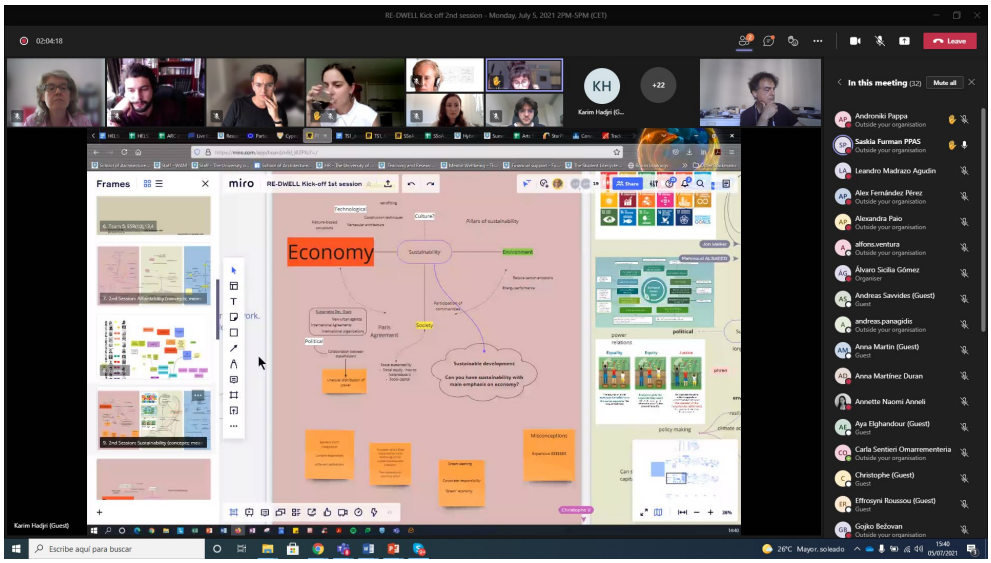

Figure 14. On-line session to create links between ESRs project during the kick-off days, July 2021

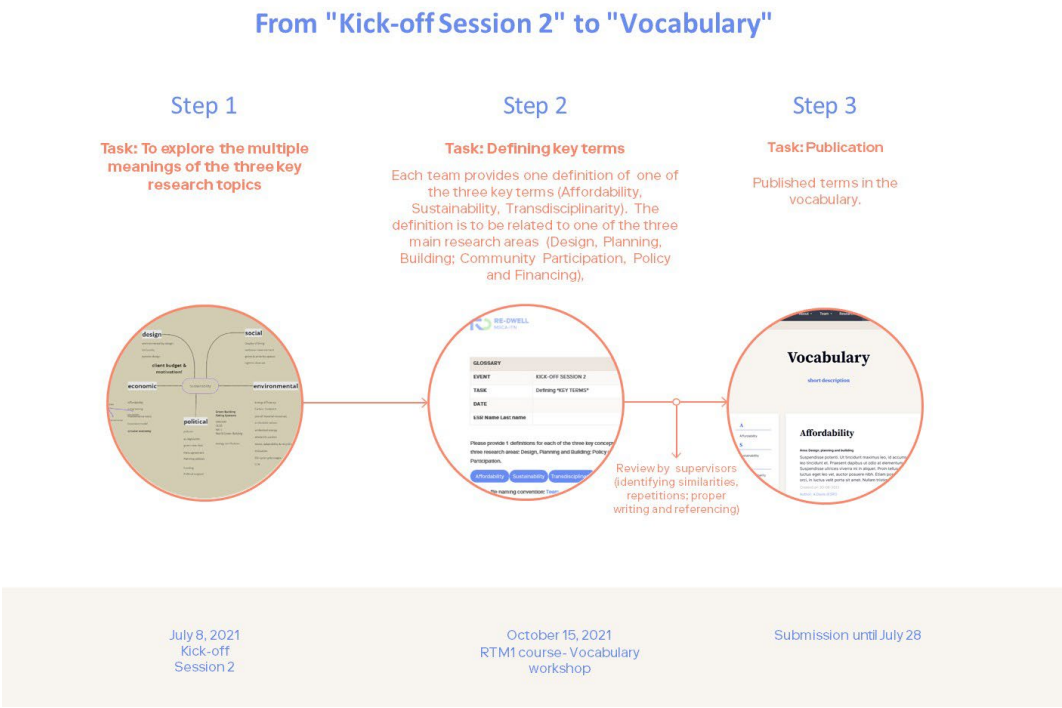

Figure 15. A learning path intertwining onsite/online, training and network activities

Different combinations of activities following this blended model have been implemented in the RMT and TS courses carried out so far (see Deliverable 2.3 “Research Methods and Tools – Report 1” and Deliverable 2.6 “Transferable Skills – Report 1”) such as:

- Online sessions with short lectures followed by teamwork and group discussions

The content is introduced in the short lectures, and students are later split into groups to continue their work. Afterwards, the joint session is resumed and the outcomes of the teams discussions shared with all the group. Typically, Miro is used as a collaborative support tool for the group discussions (Figures 16, 17).

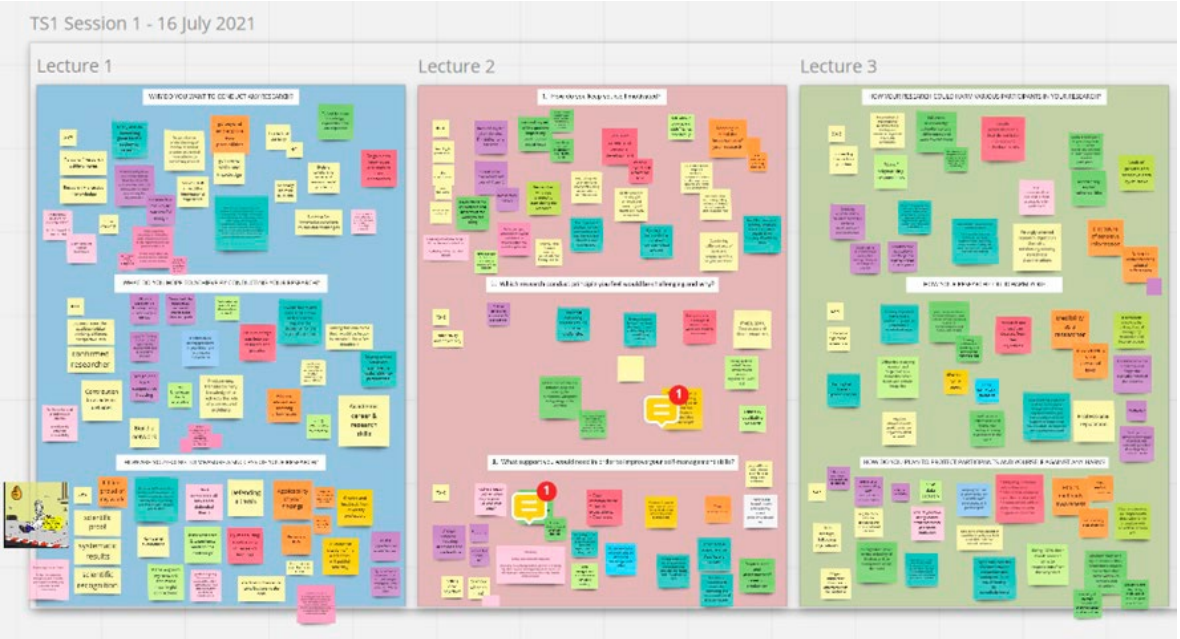

Figure 16. TS1 course: Teamwork in a Miro to discuss research conduct

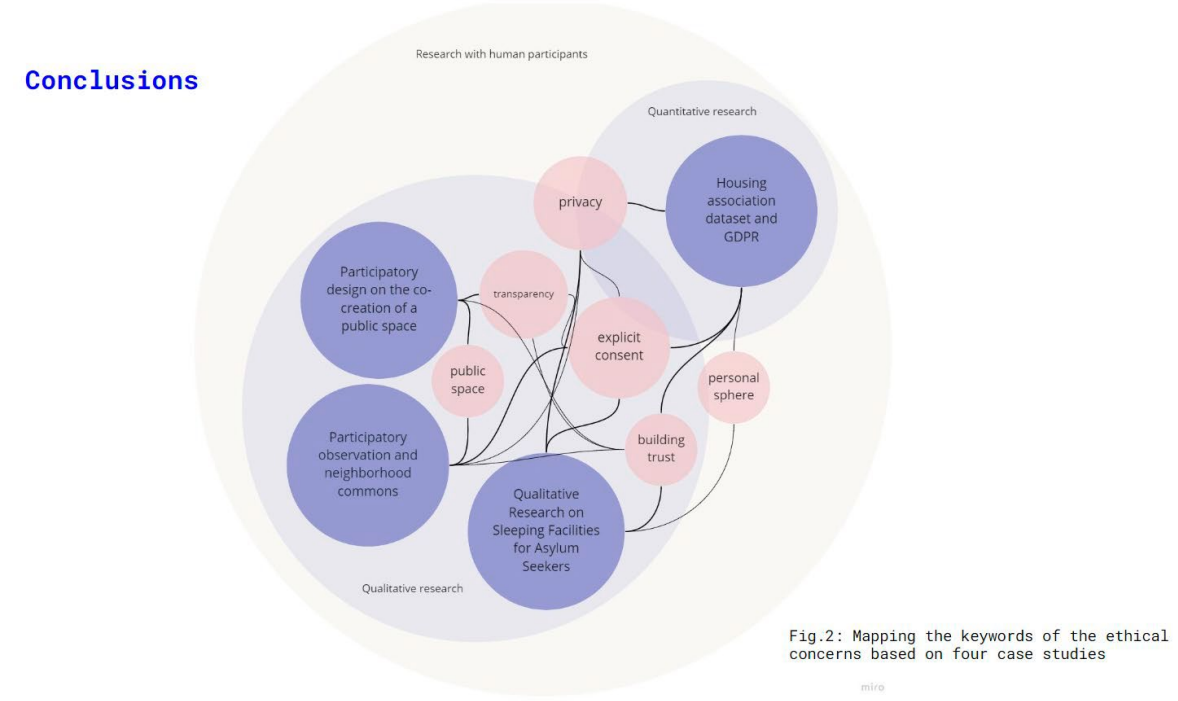

Figure 17. TS1 course: Outcome of a group discussion in online session using a Miro board. Group 2: Tijn Croon, Andreas Panagidis, Zoe Tzika

- Onsite sessions in workshops and summer schools, with lectures and exercises, followed by independent and team work to be delivered afterwards and/or discussed in online sessions.

The programme of the workshops and summer schools include sessions dedicated to courses. In some cases, a course is launched in one of the network events; in other cases, the sessions are part of an on-going course. In the in-person sessions, different learning and teaching materials are used, digital and physical (Figures 18, 19). In many cases, assignment starting in an online session continue with a team or independent work.

Figure 18. TS1 session in Lisbon Workshop

- Roundtables and discussions with experts (in-person and on-line) embedded in a course programme and delivered in a workshop or summer school in a blended format.

Roundtables with experts in the field of affordable and sustainable housing are included in the programme of workshops and summer schools. They are carried out in a blended model, with speakers participating online and in-person (Figures 19, 20). At the end of the roundtable, there is a session in which the early-stage researchers attending the event can formulate questions and discuss with the guest speakers.

Figure 19. Roundtable #1 in RMT1 session at Lisbon workshop

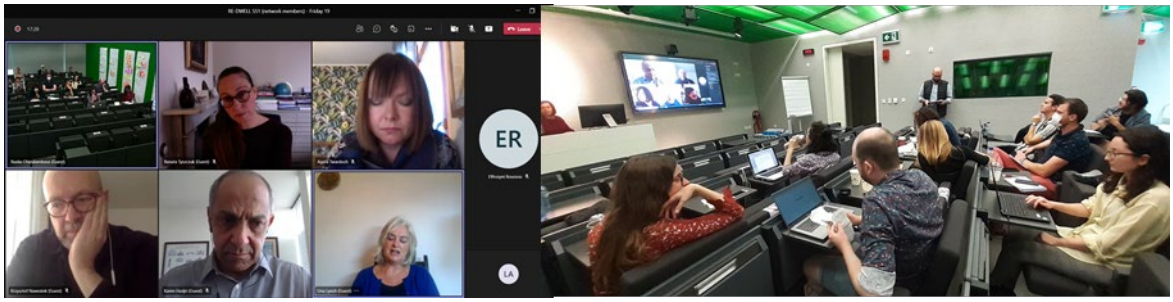

Figure 20. TS1 panel discussion in Nicosia summer school

- Independent work carried out before meeting in a network event

Independent work carried out online by ESRs, has been peer-reviewed and presented during the network's onsite events, in the context of a new onsite, collaborative learning activity.

For example, in the sessions of the Nicosia Summer School (see Deliverable 3.4 "RE-DWELL Summer School 1 (Nicosia))"dedicated to RMT1, the ESRs peer-reviewed an essay of another designated ESR written as part of the RMT1 course (see Deliverable 2.3 "Research Methods and Tools – Report 1") and already submitted online. Based on these presentations during the onsite workshop, a collective mapping was created to identify links between research projects (Figure 21). This map reflected the evolution of the network research during the first five months of activity, after an initial mapping exercise realized during the kick-off sessions.

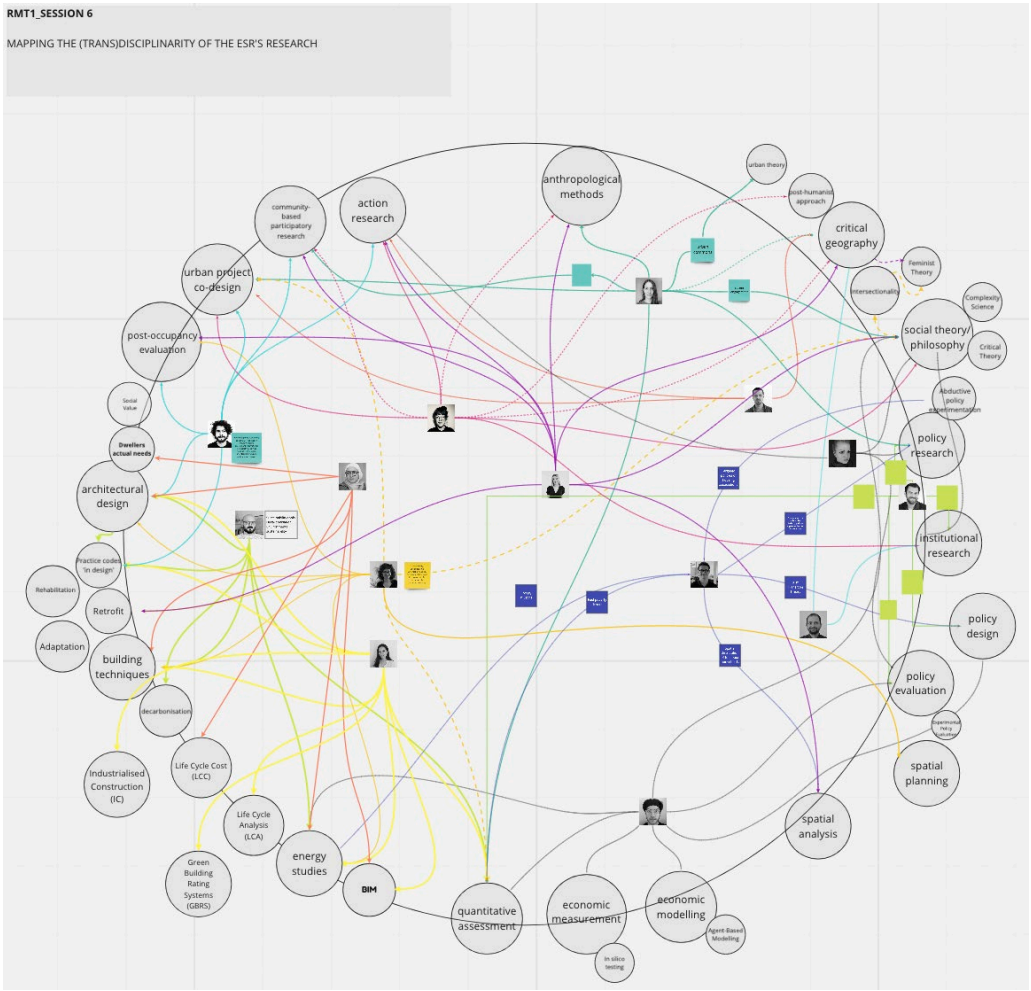

Figure 21. RMT1 Session in Nicosia summer school: collective map of the ESRs' research using Miro. Source: Adriana Diaconu, UGA

- Informal sessions and guided walkshops

Informal sessions and guided walkshops (Figure 22) during the network's onsite events (workshops and summer schools), dedicated to share with peers and supervisors, examples of good practices/case studies in the field of affordable and sustainable housing, complement the individual work of ESRs on the Case Study Library described in section 4.1.

Figure 22. Site visit to Boavista Eco-neighbourhood during the Lisbon Workshop

- Serious games

In face-to-face sessions, serious games (Figure 23) facilitate the development of strategies for collaborative solutions to affordable and sustainable housing in a problem-oriented approach. In these games, participants adopt specific roles while becoming aware of negotiation and conflict resolution processes. In addition, such activities help to strengthen the bonds between researchers. This model has been applied in one session of the Budapest workshop and has also inspired the workshop at the International Festival of Social Housing in Helsinki (Figure 24).

Figure 23. Serious game session in Budapest workshop, March 2022

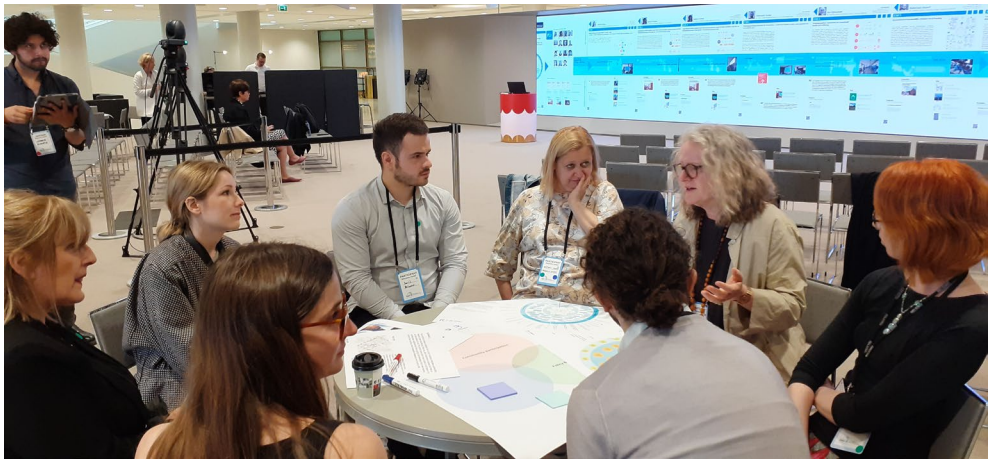

Figure 24. Group session in ISHF Helsinki, June 2022

4.1. Vocabulary and Case Study library

Vocabulary (Figure 25) and Case Study library (Figure 26) are two key instruments for the collaborative research work carried out in RE-DWELL. These two environments are integrated in the project website and have been specifically conceived to support RE-DWELL's learning and research methodology and developed by the Action's coordinator (see Deliverables 5.2-5.5-5.6 and 5-7 "Web portal- Vocabulary- Case study library- ESR profiling").

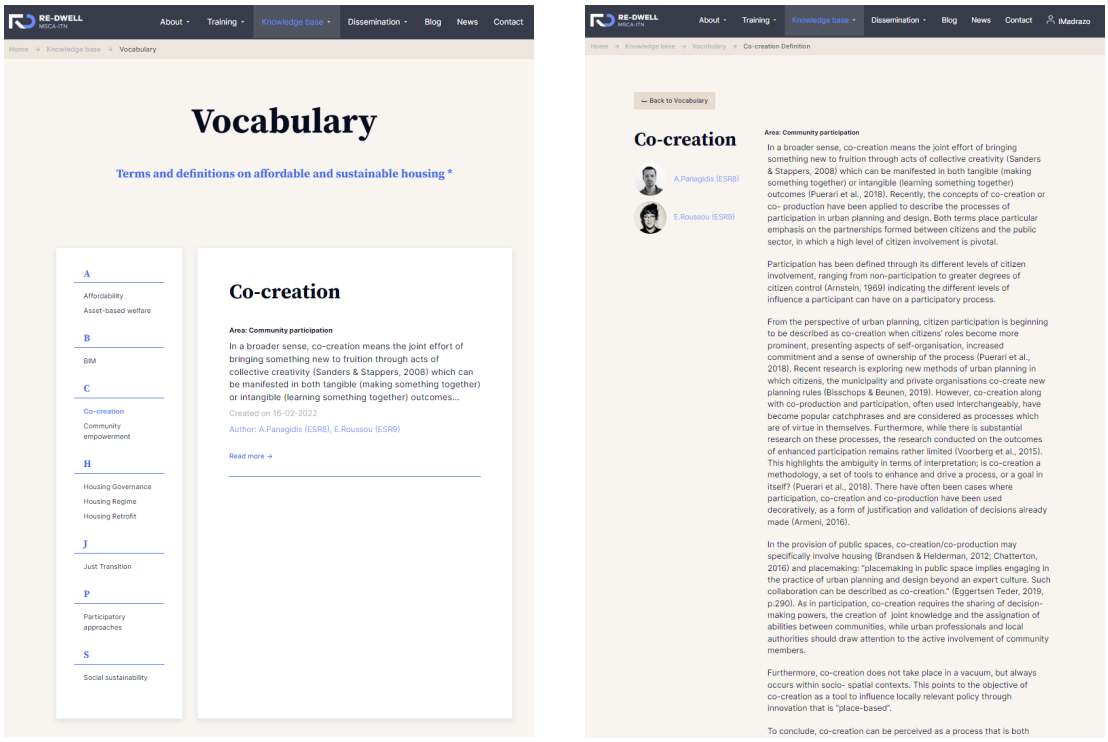

Figure 25. RE-DWELL Vocabulary in the project website

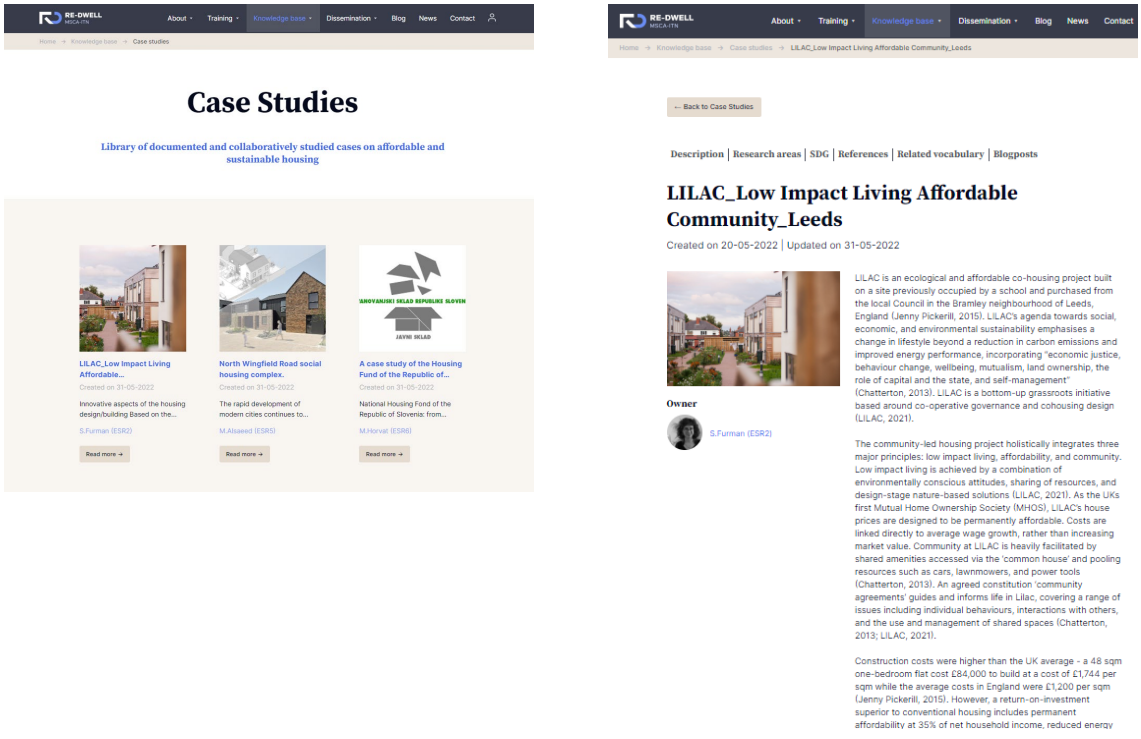

Figure 26. RE-DWELL Case Study library in the project website

The vocabulary entries and the case studies are derived from the research carried out by ESRs in their individual projects (literature review, secondments, participation in seminars and workshops, etc.). The terms of the vocabulary are linked to the three main areas of the research: Design, planning and building; Community participation and Policy and financing. These terms are the nexus between the ESR research projects and the case studies (Figure 27).

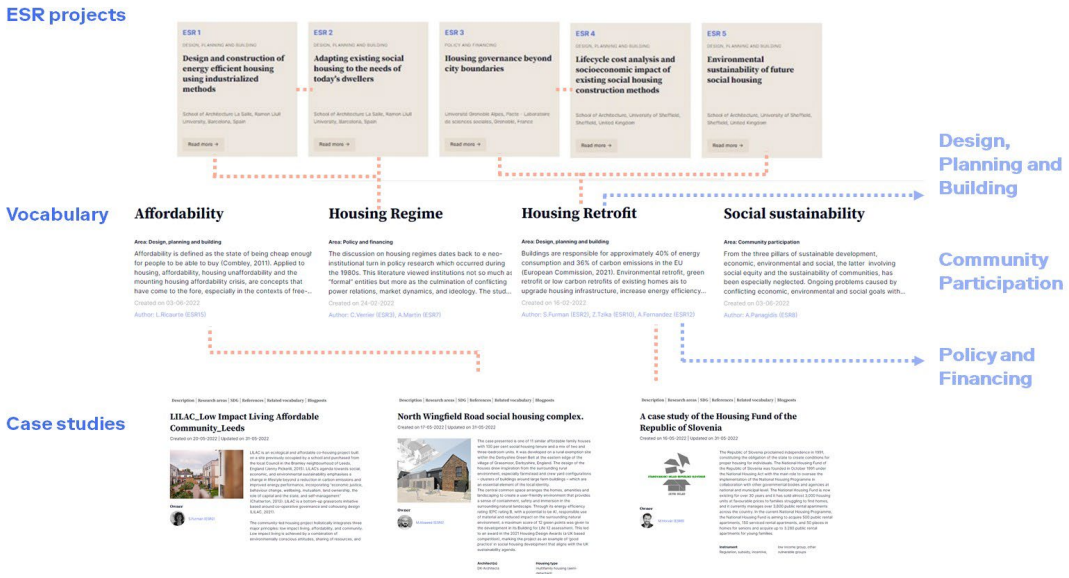

Figure 27. Team work in a Miro board to discuss the meaning of key terms

The references included in the vocabulary entries are also introduced in a Mendeley (Figure 28), to facilitate the cross-fertilization across individual research projects and to foster the transdisciplinarity of the research on affordable and sustainable housing.

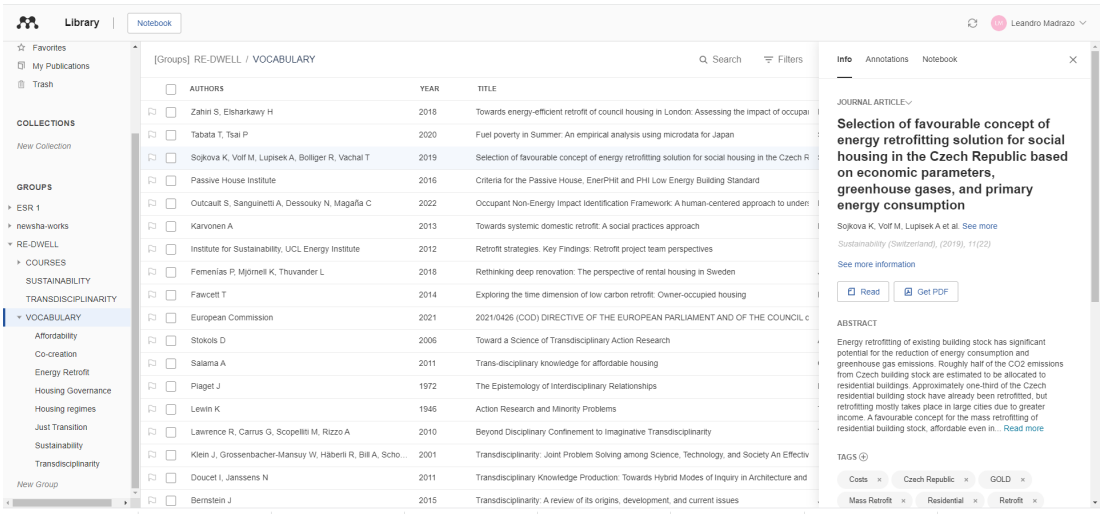

Figure 28. RE-DWELL group in Mendeley: references of the vocabulary entries

5. Learning outcomes

RE-DWELL's ultimate objective is to train a new generation of professionals to be able to address the challenges of affordable and sustainable housing from a transdisciplinary perspective, cutting across multiple disciplines (e.g. architecture, planning, sociology, politics, economics). These skills are acquired through the training (e.g. courses provided by the network and elsewhere) and research activities (e.g. individual research projects, publications). Learning outcomes of these training and research activities which are specific to RE-DWELL's objectives.

Learning outcomes, which are specific to the training and research activities of RE-DWELL, have been structured in three groups encompassing both research and training activities (see Table 1, Annex 1):

- Research areas. Learning outcomes which are related to each of the three intertwined research areas that make RE-DWELL research framework: Design, planning and building, Community Participation and Policy and financing.

- Research themes. Learning outcomes related to the three key issues in RE-DWELL's research: affordability, sustainability and transdisciplinarity.

- Courses. Learning outcomes used in the design of the RE-DWELL courses, "Research, Methods and Tools" and "Transferrable skills".

6. Conclusion

RE-DWELL's blended learning environment has been configured to respond to the needs and objectives of the network: to support a small group of learners and foster collaboration in knowledge construction, intertwining face-to-face and online learning activities. On the one hand, an existing technological solution -MS Teams- has been adapted to the needs of the network for communication, file sharing and group work. On the other hand, specific tools have been conceived and implemented to support the construction of collaborative knowledge and transdisciplinary research -Vocabulary Library and Case Studies-. Parallel to the implementation of the technological platform, at the start of the network activities in July 2021, a methodology combining online and face-to-face activities and interlinking training (e.g. courses) and network activities (e.g. workshops, summer schools) was implemented and has been further developed in the following year.

Annex 1 – Learning outcomes

Table 1. RE-DWELL Learning Outcomes

TEACHING AND LEARNING THEMATIC AREAS	TOPICS	LEARNING OUTCOMES
Design, planning and building	Industrialized construction Green building Building retrofitting and urban regeneration Housing design education	Knowledge of design and construction of sustainable housing with industrialized methods Knowledge of sustainable materials and building components Knowledge of application of BIM and digital fabrication in A&S housing Comprehension of the environmental impact of materials and technologies and evaluation criteria like LEEDS, etc. Knowledge of renewable resources at building and neighbourhood level Understanding of methods and tools to support environmental sustainability in the design, planning and operation of residential buildings and urban environments Awareness of various green building certification programmes and building standards for housing Ability to apply various metrics and measurements for benchmarking and performance Knowledge of housing retrofitting and urban regeneration approaches Ability to apply ICTs to smart housing/living Awareness of post-occupancy evaluation Awareness of academic programmes embracing inclusive housing design studios, open to multiple stakeholders, embedded in local milieus
Community Participation	Co-housing and co-design Community planning	Understanding of co-housing as a mechanism to achieve sustainable dwellings (environmentally, economically and socially)

	Inclusive design Transient and digital societies	Knowledge of community engagement approaches, tools and methods Ability to identify and explain different concepts of community participation in housing Ability to critically reflect on the relative merits of each concept and approach Understanding of urban living labs as drivers of social and urban change Knowledge of cases of revitalization and regeneration of housing estates and derelict urban areas through participatory actions Knowledge of public-private partnerships to support housing retrofitting and urban regeneration programmes Awareness of the living conditions for elderly/ disabled persons/vulnerable groups (housing, access to public spaces) Understanding of ways of adapting existing buildings and neighbourhoods to the needs of these groups Awareness of intergenerational housing projects Understanding of the intertwining of digital and physical structures in contemporary urban life, Understanding of the impact of mobile populations (tourists, migrants, refugees) in residential buildings and neighbourhoods
Policy and Financing	Innovative procurement Social housing policies Vulnerable groups Governance, market and financing	Awareness of policies and practices implemented by federal, state and local governments to understand the multi-scalar nature of housing policy Understanding of policy principles to provide a theory-based understanding of causes, outcomes, trade-offs and interventions related to housing

		Knowledge of incentives and specific financing mechanisms used to support the development of affordable housing Understanding of the role of the public sector in regulating and creating incentives for the development and financing of affordable housing Knowledge of social housing policies Awareness of financial innovations to support social housing Awareness of the relation between the market, financing and governance Ability to identify appropriate financing options for different cases Knowledge of ways of transferring good practices from one country to another overcoming institutional differences Ability to identify the core programmes and ideas in contemporary low-income housing policy Ability to develop an independent vision to improve the provision of housing assistance for low-income families and vulnerable groups Ability to acknowledge the competing goals of housing policies, including efforts to create economic opportunities and assure access to housing.
Affordability	Approaches and mechanisms of affordable housing provision at multiple scales	Ability to identify and explain different concepts and measurements of affordability in housing and different approaches/mechanisms of affordable housing provision. Ability to critically reflect on the relative merits of each concept and approach to affordability Understanding of the important principles of adequate housing provision and how to apply them in assessing existing policies Understanding of the need to adopt a more holistic view of housing affordability which

		encompasses sustainability (in the economic, social and environmental dimensions) Understanding of the interactions across multiple scales –housing unit and building, city and region and realms –physical and social structures, social and urban environments in relation to affordable housing Ability to apply the above knowledge to design alternative concepts of housing affordability measurement and alternative approaches to deliver affordable housing
Sustainability	Society, housing, environment Technology, building materials and energy sources Eco-sensitive design processes Green practices	Understanding of the various visions and interpretations of sustainability related to society, housing, financing and the environment Ability to critically reflect on the relative merits of each concept and approach to sustainability Ability to articulate the various concepts and strategies of sustainable design and green practices Understanding of the involvement of multiple sectors in sustainable housing (design, urban planning, finance, procurement, governance and maintenance) Ability to compare and analyse these sustainable residential practices, identifying limitations, strengths, and contextual applications Ability to develop a rigorous framework to assess the role of the technologies related to building materials and energy sources for housing. Ability to address eco-sensitive sustainable design processes, features etc. Knowledge of consequences of climate change, depletion of natural resources, demographic transformations, and economic inequities that threaten to

		unhinge residential stability and sustainability Understanding and identifying principles of active and passive sustainable building and infrastructure practices for: energy efficiency and renewable, water efficiency and reuse, ventilation, indoor air quality, waste reduction and recycling, occupant lifespan adaptability and accessibility, occupant health, financial/economic sustainability
Transdisciplinarity	Concepts, tools and methods Transdisciplinary research proposal Knowledge production concepts (interdisciplinarity, multidisciplinarity, transdisciplinarity)	Understanding and analysing different approaches to housing issues in terms of methods (interdisciplinarity, transdisciplinarity, etc.) Knowledge and understanding of concepts and approaches to transdisciplinarity Ability to critically reflect on the relative merits of each concept and approach to transdisciplinarity Awareness of methods and tools employed for a transdisciplinary process Ability to critically analyse and assess cases of transdisciplinary processes Ability to create a transdisciplinary research proposal in which students defend their own approach to transdisciplinarity based on the critical synthesis of the course materials
Research Methods and Tools	Research approaches to housing research (interdisciplinary, multidisciplinary etc) Comparative methodologies Quantitative and qualitative tools and methods Policy-relevant research Transferring of research findings to community	Understanding of different disciplinary perspectives to housing research Ability to analyse different research approaches to housing issues in terms of methods and methodological mix (interdisciplinarity, transdisciplinarity, etc.) Understanding of the limitations of particular research methods Ability to understand and critically reflect on comparative methodologies for qualitative and quantitative analysis in housing research Ability to analyse and position own research and that of another ESR within the field of housing studies in relation to different disciplines

		Demonstration of the ability to understand and to choose methods appropriate to research aims and objectives. Ability to analyse the use of two fundamental concepts of housing studies - housing affordability and housing sustainability - and apply them in own research work Ability to create a transdisciplinary research proposal in which own approach to transdisciplinarity based on the critical synthesis of the course materials, is defended Ability to link social science research to the formation of housing policy; identification of multiple methods of social research, including ethnographic studies and analyses of administrative datasets. Ability to evaluate how research shapes public policy and to consider the challenges of conducting high quality, policy-relevant research through the lens of affordable housing policy, Ability to analyse and understand ways of transferring research findings to the community
Transferrable Skills	Personal qualities and self-management Ethics, open science and IPR Entrepreneurship and professional career Communication, engagement and impact Professional and career development	Ability to engage in research and maintain enthusiasm and motivation. Awareness of personal qualities and a willingness to demonstrate them Awareness of responsibility for own project and own wellbeing Ability to manage own time and deadlines effectively Understanding of research ethical principles and guidelines across scientific fields Understanding of data ownership and management rules Understanding the value of research outputs, sharing and impact Knowledge of IPR policies and procedures Ability to define basic terms and concepts in the area of entrepreneurship

		Ability to analyse housing environments in order to identify entrepreneurial opportunities Ability to identify the elements of success of entrepreneurial ventures Knowledge of the basic performance indicators of entrepreneurial activity Ability to evaluate the effectiveness of different entrepreneurial strategies in housing Ability to engage with external stakeholders (non-academic sectors, local administrations, civic organizations), dealing with sustainable and affordable housing Knowledge of communication and dissemination mechanisms of own research Understanding of the connection between effective career/major exploration and the achievement of personal, professional, and academic goals Ability to identify resources for researching majors, careers, internships, and employment Ability to identify potential career areas and majors that reflect own values and interests Ability to identify and pursue employment opportunities (networking, resume-writing, and interviewing) Ability to develop a preliminary career plan