EUt+

European University of Technology

Deliverable 36

D3.4.2b.c Summer schools package

Del. Rel. No D3.9

WP 3

Description: Summers chool pedagogical and annual activity report, planning of the following activity

Comment:

Dissemination level: **PU**-Public

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Foreword to Section 3.4.2b

Humboldt argued that a university should be a place for addressing questions for which no tailor-made answers are available, to produce new knowledge. In the pursuit of knowledge, the boundaries between student, teacher and researcher blur. This, we call *'circular pedagogy',* as all are engaged in a common quest to generate new insights. The Humboldtian university is also a place that educates future citizens through the development of critical thinking skills to better support society. In the Humboldtian sense, we use the term '*smart educator*' as someone who can switch roles between student, teacher and researcher – as all will navigate between these roles in their education. Thus, all at University are equally engaged and eager to reach a deeper understanding of both higher order questions and new insights. We are reimagining educational models in terms of teaching-learning-research, in order to identify evidence-based-practice in daily teachers' practice. This new research space is an open space to the debate and consideration of the Alliance New Educational Model. In it we will look back to tradition, learn from what has been done and look forward to innovation and technology, keeping "Human First" at the core of our moving forward. In this light our joined efforts have explored our openness to bring on board EUt+ views, insights and visions.

In this new research entity we are inspired by the Humboldt ideal of university and our institute is re-imagined in the context of new learning technologies, with strong focus on a human dimension of learning and education (Pritchard, R.,2004). The ELaRA members will engage in critical thinking and in a reflective process where, '*circular pedagogy*' is core to a group that aims to create a ground-breaking powerhouse for innovative teaching, learning and research pedagogies framed within an all-inclusive collaborative learning environment. In the context of current global challenges, it is vital to consider the need to co-create knowledge share knowledge, to be open to criticism and feedback and to consider continuous input from students as part of our research work.

Digital literacy, capabilities and competencies for developing a sustainable attitude and for supporting a plurilingual and multicultural education will be integrated as part of the learning and

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teaching philosophy as an enabler of inclusion, collaboration, and knowledge sharing (Sanders, 2020).

- Hochschule Darmstadt, University of Applied Sciences (Germany)
- Rīgas Tehniskā universitāte (Latvia)
- Technological University Dublin (Ireland)
- Технически университет София, Technical University of Sofia (Bulgaria)
- Τεχνολογικό Πανεπιστήμιο Κύπρου, Cyprus University of Technology (Cyprus)
- Universidad Politécnica de Cartagena (Spain)
- Universitatea Tehnică din Cluj-Napoca (Romania)
- Université de technologie de Troyes (France)

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I. Objectives and Goals

1.1 Previously Defined Objectives

During the last Summer School (Darmstadt online 2021) (Deliverable D3.4.2) we established our goals of the next Summer School (Troyes hybrid 2022) as sharing research and actions at all levels:

A. Feedback from practitioners

B. Testimony and analysis of students

C. Presentation of research works

D. State of the art and orientation of the present laboratory (future European Institute)

1.2 Outputs of previous objectives

A. Feedback from practitioners

We met online and peer reviewed and obtained feedback from practitioners across the EUt+ members in online sessions based in Cluj, Riga and Sozopol meetings. These findings were synthesised into a white paper which sought to define the combined feedback as summarised below.

The term "pedagogy" denotes the science whose object of study is education and consequently, it studies the laws of the education of the young generation in particular, but also of the education of man throughout his life on a cognitive, affective-motivational and psycho-motor level, through analysis at the level of: ideal, content, methods, means, forms. Without minimizing the importance of philosophical, psychological and social aspects in the implementation of the any educational process, innovative teaching practices are also highlighted in the specialized literature as essential approaches addressed to the crisis at the level of the learning process and the rigor of transforming the education process in order to provide an adequate response global challenge. In this frame of reference, innovation in pedagogy is a critical and central element underlying the effort to change education systems for learners and for teacher as well. We explored the traditional elements in educational systems and identified common elements for building an innovative common learning environment based on individual traditional pedagogical particularities and cultural historical elements of the countries for a shared circular pedagogy for all in the context of EUt+ initiative.

We must emphasize that technical universities participate in EUT ELaRA, where, when talking about pedagogy, the emphasis should be placed on the fact that the academic staff of technical universities have obtained an education in engineering, economics, etc., where basically no pedagogical education has been obtained. Therefore, it is necessary to divide the academic staff into 2 groups:

+ those who have received pedagogical education;

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- those who do not have pedagogical education (technical universities).

In our case, there should be a specific approach, because we work with the 2nd group. This indicates that we cannot talk about pedagogy in general. In this regard, we need to shape our views on what pedagogy really means in technical universities and create a common ground for daily teaching and learning activities that will be scaffolding on evidence-based practice tasted and experimented across different disciplines and contexts in order to create synergies at higher education level but also at specific cross-cultural environments.

B. Analysis of students perspectives on learning process and outcomes

Based on our review of gathered testimony from each of our partners from online surveys and literaure review with key references shared on Whaller within the group we identified the need to upskill the staff in digital pedagogy to support the students. This led to a successful Erasmus+ application.

The project is entitled *Transformative Digital Pedagogies for Higher Education* (TDP4HE). The main objective of the TDP4HE No.2022-1-LV01-KA220-HED-000085277 project is to empower academic teaching staff with transformative digital pedagogies competences. For this purpose, the project aims to create a scientific basis for the identification and assessment of pedagogical competences of educators; guide and advise educators on the selection, critical use, and design of transformative digital pedagogies; and develop a community for the exchange and spread of innovative teaching practices in HE across Europe. The TDP4HE project will create a focus group for the co-construction of a new self-assessment framework of academic staff competences on transformative digital pedagogies (TDP); organise three hybrid events for the presentation of the project results; implement two series of a training programme dedicated to TDP emphasising the role of educators on social transformation; develop a virtual space for Open Educational Resources (OER) and Open Educational Practices (OEP) users; and create an open community of practice platform. The main deliverables of the TDP4HE are: The TDP4HE self-assessment framework of academic staff competences on transformative digital pedagogies (TDP) and e-Tool; Webinars from the training programme on TDP; a digital trainer's guide with practical instructions and advice on how to implement training on TDP; an e-Toolkit with OER and OEP; the TDP4HE open community of practice platform where the academic community can have access to the project resources and interact with peers by sharing their teaching practices and their own OER/OEP.

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C. Presentation of research works

We used the online and hybrid meetings to share our current research thinking, this led to an identification of common interests and laid the groundwork for content for dissemination at an upcoming conference on *Disruptive Thinking* in Barcelona, organised by an EUt+ELaRA core member Dr Lucía Morales. We are currently preparing a series of thought-provoking papers which look at different aspects of our philosophy and application of *Circular Pedagogy*.

The white papers that arise in the context of present Summer school are:

1. A Circular Pedagogy for Higher Education - Working paper No. 2022/01 – first author- TUDublin Lucia Morales and all

2. Circular Pedagogy for Smart, Inclusive and Sustainable Education - Working paper No. 2022/02 – first author TUDublin Patrick Flynn et al.

3. Advanced Learning Technologies to Accelerate Universities Institutional Cultural Transformation - Working paper No. 2022/03 – first author UTCN – Nadia Barkoczi et al.

4. Mind the gap! Between tradition and innovation in the context of Circular pedagogy:

A multiple study case – Working paper No.2022/04 - first author TUS – Ivaylo Peev et al.

5. Transformative education through circular pedagogy in the digital age

Working paper No. 2022/05 first author CUT Maria Victoria Sole and all.

6. The practice of the transition towards a circular pedagogy for transdisciplinarity in urban ecology – Working paper No. 2022/06 – Fist author UTCN - Claudia Marian et al.

7. Education for Sustainable Development: what, why and how in the context of EUt+ Fist author – TUS – Todor Todorov et al.

8. Reconsidering The Visualization Of Scientific Information As An Essential Part Of The Pedagogical Process In Higher Education Working paper No. 2022/08 – TUS – Todor Todorov et al.

Other projects that are works in progress:

1. Systematic literature review – (first authors Elis Kakoulli Constantinou and Maria Victoria Soule)

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2. Peer observation – (Muireann O Keeffe, Inna Mikhailova and Elis Kakoulli Constantinou)
3. Identify pedagogical practice in EUt+ TUDublin + CUT+ UTT (Patrick Flynn, Yann Verchier and Elis Kakoulli Constantinou)
4. Identify Phd candidates needs – TUDublin+CUT
5. Preparing a second research event to take place in Bulgaria -TUS with collaboration from TU Dublin and Cluj. Disrupting Thinking event and our research event in Bulgaria will lead to our Disrupting Thinking roundtable to take place mid-2023 – next steps
6. Vertically Integrated Projects – Students at different career stages in different disciplines and Universities working together.

D. State of the art and orientation of the present laboratory (future European Institute)

We have complied our thinking in a document in our GIL document (completed December 2021). This has been developed into a more holistic approach to our work for a new pedagogical framework detailed in the present ERI application elements of which formed the basis of our two white papers descibed under the previous heading.

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II.Tasks

2.1 Summer School Meeting

This event was organized according with EUt+ requiems described in the main application section Work package 3, t3.4 - Common European Laboratory for pedagogical action research and student centered learning. The agenda was established according to result of our previous Summer School event and with the objectives and strategic plan, described in the first t3.4. Deliverable – General Installation Layout, submitted in February-March 2022. As a result, we came up with new outcomes that are described in the next sections of the document.

2.2 New Tasks defined

- Refine our newly defined *'Circular Pedagogy'* philosophy through reflection within the team and dissemination to the wide academic community
- Identify short-, medium- and long-term research directions through the ERI document.
- Further our collaborative partnership with external partners to support our transdisciplinary approach
- Develop our successfully funded Erasmus+ project into a useful tool for the ELARA project
- Develop a new Erasmus+ proposal based on Training and secondment for postgraduate master-by- research and doctoral student
- New educational programmes

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III.Report Activities of Summer School

3.0 Title

Based on out previous work we decided to focus on Education and Technology in our Summer School to consider emergent approaches in pedagogy and imagine future directions for promoting sustainable education and a new paradigm for pedagogy informed by evidence based practice. In this light we had the following sessions, with Iulia Stefan (TUCN) as general moderator and with Tassos Natsakis (TUCN) as online support for the hibrid part of the event.

Day 1. Tradition in pedagogy

3.1 Description of Circular Pedagogy & Framework

In this session we gave an overview of our activity in task 3.4 and we presented the concept of this new pedagogical approach named *circular pedagogy* - the concept arises as a result of our common activities and document, General Installation Layout (GIL) and European Research Institute Application (ERI). We organised this session and concepts based on a mindmap exercise. As a result of this session we concluded that this new concept has huge potential due to the pragmatic arguments; we need to refine the common understood definition and we need to identify how this concept can be applied in different educational contexts and fields. We had representatives from all universities.

3.2 Future Workshops Ideas

We had a briefing meeting to discuss ideas for future workshops based on the information from previous sessions. In order to identify relevant topics and activities, we analysed the proposals from our partners in Darmstadt, Cyprus and Bulgaria.

From this meeting we established the themes for future workshops and timelines for these events.

Conclusions

We will organise in the next period three workshops to be organised by team members : Elis, Todor and Inna.

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3.3 Tradition in Pedagogy

In order to respect specific context and the multi-cultural aspect of our participants we organised a teacher panel to focus on debating national traditional pedagogy. Iulia Stefan, the moderator of the Elara Summer School, organized in UTT, moderated this session as well. The purpose of this session was to identify common language and understanding of pedagogy in the context of EUt+. The result of this session was the identifying of different perspectives regarding pedagogy along with the responses we gathered from previous online protocols. All of these are outlined in our White Paper 4 : *Mind the gap! Between tradition and innovation in the context of Circular pedagogy.*

This paper was dessiminated and discussed in the conference *Disruptive Thinking* in October 2022.

Day 2 Emergent Approaches in Pedagogy

If in the last day we focussed on the tradition in pedagogy the next day focussed on the many emergent approaches in pedagogy and the direction from European Commission regarding digital competencies and the use of technologies in the educational context.

3.4 Establishing a common ground for EUT+ through Virtual Reality

> This session was divided into a more theoretical and a more practical part that contained the implementation of VR in pedagogical projects and courses that could be applied within the EUt+ alliance.

The theoretical overview of how Virtual Reality can help with the minority languages within the Eut+ allliance by Camille Taboulot (UTT) highlighted on the importance of including minority languages like Greek, Bulgarian, and Romanian within the alliance and promoting them for students through various projects, for example, telecollaboration or Virtual Exchange (VE) projects, which are pedagogical projects that engage students in collaborative tasks with common aims.

In the following section, two undergraduate students, Mary Patsalou and Elena Salman from CUT, shared their experiences from a pedagogical VE project they participated with a foreign European university through the use of Virtual Reality. This presentation emphasised on how the affordances of VR (i.e., a sense of presence, immersion, embodiment, etc.) can facilitate undergraduate students' communication and linguistic practice through the use of avatars and VR-mediated pedagogical tasks and bridge their differences through the embodiment and the simulation of authentic scenarios.

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The next presentation was called «Fostering Learning Opportunities through Virtual Reality » by Maria Christoforou from CUT. The presentation focused on the pedagogical uses of VR in undergraduate language courses, specifically in English for Specific Purposes (ESP) courses.

The implementation of Commercial off-the-shelf (COTS) applications was based on the VR Application Analysis Framework (Lege et al., 2020) which provides a pedagogical theoretical background for the applications so that they are not just a form of entertainment. The VR Analysis Framework is based on four dimensions: a) communicative ability, b) presence, c), immersive capacity, and d) cognitive load. Important emphasis was given on Pedagogy and Virtual Reality in tertiary education ESP courses. The pedagogical term « transmediation » was used, a term coined by Suhor (1984) which referred to « the student's translation of content from one sign system into another » (p. 250). This involved the various semiotic modes ESP students studying English for Fine Arts used to experience the Surrealistic art movement. This constructed embodied learning experiences for the students, presenting situated representations of the artistic content.

Another pedagogical dimension investigated the link through language and action (Fuhrman et al., 2020) in the course « English for Electrical Engineers ». It is commonly recognised how Engineering constitutes a significant part in the Eut+ curricula. VR. Specifically, the application « HV Electrical Substation – VR Training for Electricians » can transform the learning experience of future engineers by engaging them in authentic experiences through familiarisation with their future workplace environments, an aspect which cannot be achieved within the traditional classroom.

Finally, a third pedagogical VR-mediated proposal was introduced through the application « Tilt Brush », a 3D virtual painting program to introduce creative digital designs.

According to Mills (2022), when students engage in multimodal compositions, they use the full sensorium in digital designing, extending current understanding of how perceptual and motoric experiences can optimise word learning in non-digital contexts, such as gestures and actions to anchor new vocabulary in the mind. Another important aspect is that when students « enter » their own multimodal compositions, they become « designers » of their own learning content, a concept which was introduced by the New London Group (1996).

In conclusion, all of the session participants identified ways in which this VR-mediated courses can contribute to successful learning and the beginnings of a guide checklist was outlined in how to identify the context for the application of this method. This project could lead to an in-depth research into guidelines for when virtual reality is the most appropriate learning tool; exploring pragmatic issues such as finance, efficiency and efficacy.

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3.5 Qualitative Research Application

This presentation and workshop highlighted the importance of Qualitative analysis in using teaching techology in teaching practice. Through this workshop together with the students we identified ways to develop critical thinking and the application of qualitative research in transdisciplinarity projects.

The session included a newly written report on the efficency of technology in educational practice led by our colleague Victoria Soule from Cyprus.

We concluded that the qualitative framework is a valid research approach in order to explore the efficiency and appropriate application of technology ; taking in to account issues around costings.

Day 3 Future directions

3.7 Theoretical framework of transformative digital pedagogical competences – Start Up meeting of the project: *Transformative Digital Pedagogies for Higher Education*

The session began with an outline of the successfully funded Erasmus+ application, the scope of work was described, the work package deliverables were listed with the key people responsible and timelines for completion of tasks. The group agreed to the proposal and committed to the workload.

This was followed by a comparative research study of digital transformative research projects across six European countries.

The study will form a springboard for elements of the Erasmus+ project.

3.8 Student Panel

The next session moderated by Sonia Munteanu (UTCN) began with a series of prompt questions that were prepared in advance of the meeting in Troyes to allow the students to reflect on their learning experience. The questions focussed on their transition into University, their experiences whilst there and their future career path. The session was conducted in online and in person format.

The group ended with a series of recommendations with students identifying the importance of good mental health, support and mentoring issues with peer-to-peer learning and supporting growing independence over the education journey in University, the importance of learning by doing and work experience.

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The issues raised will provide material for further pedagogical research and could form the basis of an educational template in the EUt+.

3.9 Roundtable Participants Workshop 1 Possibilities

These workshops focused on bringing colleagues together to exchange ideas around future collaboration be it research projects, shared student projects or publications. The participants were asked to engage with a theme chosen at a table then discuss the topic before choosing their next table and new topic to discuss.

3.10 Roundtable Participants Workshop 2 Values

The next workshop continued in a similar format and focused on our values as a group of students and teachers. It also began to identify some of the barriers to progress our ideas and ways to overcome obstacles.

The workshops ended with participants identifying common areas of interest, potential research as well as identifying the potential issues that can arise in a collaborative research project.

We end in a positive and optimistic atmosphere regarding our work and future directions, happy to continue our work in future meetings both online and in person.

IV.Conclusion of the Troyes Week Summer School

We presented, debated and clarified our thinking around the key concept of '*Circular Pedagogy*' and how it can inform our research.

This led to a focus on how teaching technologies can enhance and support our new pedagogical approach via the workshops and presentations on online platforms. We had a student centred workshop, a staff led panel and a presentation of research ideas along with a survey of the current status across four European Countries to give interrogate this topic in depth.

Through examples and literature review we outlined how qualitative research methods can analyse the impact of including new technology in teaching practices. We focused on qualitative approach using the experience of teachers and students in this Summer school due to our diversity and acknowledging the varied context which requires a qualitative analysis approach.

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We had our first meeting to discuss the implementation of the Erasmus+ research project and set timelines.

We met and brainstormed ideas for future collaborative research projects and publications.

This Summer School allowed us to check on progress of the previous tasks identified last year and to establish the new tasks as identified in Section 2 for the coming year.

V. Route Map - Task 3.4 from Lab to Institute (Next steps)

During Troyes week, T3.4 ELaRA members had organize the Summer School Event based on which will be developing the third deliverable for this task D3.4.2.b Summer School Package- a cluster of files and tools.

The main topic of this Summer School was Education and Technology. The 3.4 group organized specific sessions focused on developing a new pedagogy and education model dedicated to HEI in the context of EUt+ in order to prepare students for the great challenging of the future. The Summer School event was open for students, teachers and researchers in hybrid mode.

After the introduction, we continued the Summer School event with the presentation on the evolution of the ELaRA task as follows:

- ELaRA task was split into 8 subtasks detailed in the first deliverable D3.4.1. General installation layout and as result, during last year the core members from all those 8 universities were working on:

1 - Research projects

This task is led by TUDublin and UTT. Based on a previous physical meeting in October, Darmstadt the direction was to apply for European Research Institute. In this light, as part of the Research project framework developed the application for European Research Institute is based on the template received from the representative of WP 4 - Research and Research training received in April 2022. The 3.4 members reviewed the completed and added important sections in order to present a clear picture of the vision and direction of the future research institute from the t3.4 core members point of view and based on their perspective. Because in the ERI application was developed a new framework regarding pedagogy that can be applied in all EUT+ domains, part two of the introduction session was focused on presenting and debating the new concept

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developed in ELaRA - circular pedagogy in the context of the teaching of Technologies. Based on this task, 3.4.1 was identify research directions that were debated in the last session of the Summer school after the brainstorming session organized in order to create a new theoretical framework and disseminate the results throw publication, according to the General Installation Layout direction. Based on the previous work elaborated in the first 2 deliverables of task 3.4 European common laboratory for pedagogical research and student-centered learning, this application is the result of the working process in t3.4, debated in the second summer school event. Due to the fact that, based on this SS event, the 3.4 members have to deliver the outcomes of the t 3.4 join efforts, the ERI application will be part of Summer School Packe Deliverable 3.4.2.b (cluster of files end tools (ERI application- strategic tool for running the future European Institute)

2 - Support projects

This subtask is led by CUT and H_da. In this task, we are currently working on the following projects:

1. A systematic literature review regarding the support that academics receive from their Higher Education institutions in relation to technology and teaching practice. This study aspires to become the basis for the desing of future support projects for students, teachers, and researchers. Currently 12 colleagues are involved in this project. The project is led by CUT.
2. A peer observation project entitled ”Developing digital pedagogies through a Pan-University peer observation of teaching”. The purpose of the project is to propose the model of Pan-University Peer Observation of Teaching (PoT) to provide a structured opportunities for professional conversations among higher education teachers, through which observation, reflection and dialogue on teaching practice can develop and transform teaching perspectives, while also developing new teaching skills and pedagogies. The project is led by TUDubin.

2.1. Results: The Pilot Project was launched in November 2022 with 6 Participants from TUDublin, UTCN, RTU, UTT, TUS, UPCT and 3 Facilitators from h_da, CUT and UTCN

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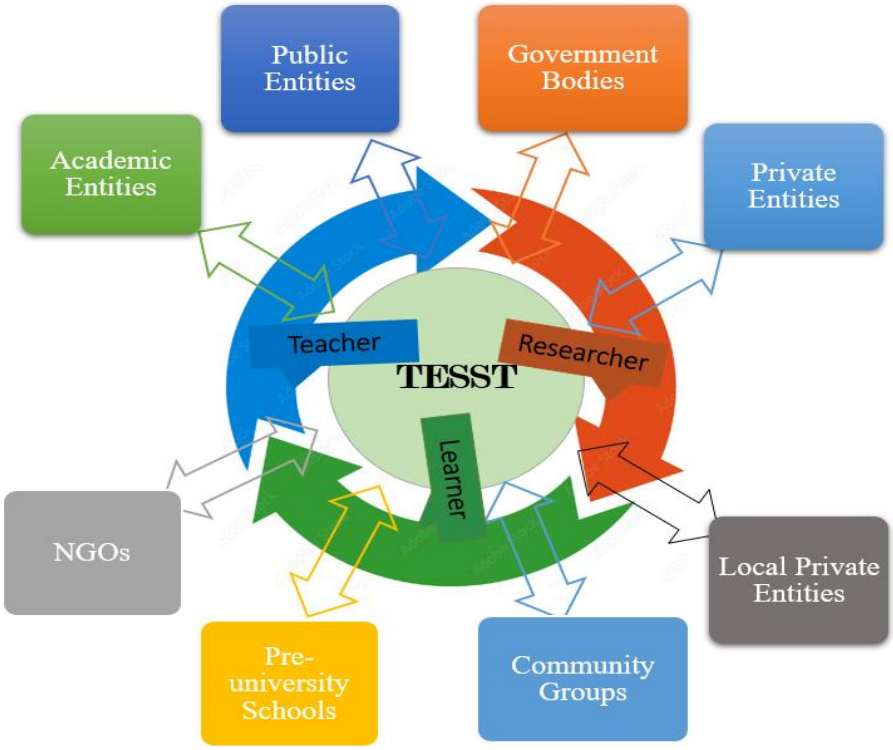
3- Ph.D. students' strategy.

TUDublin and CUT are leading this task and currently analyze the data from 2 questionnaires regarding the needs of the Ph.D. students. Based on this key action a strategy for Ph.D. candidates will be developed.

4 - Link with private and public entities all over the world.

This task is led by all campuses and is based on the particular connection between ELaRA core members and other entities. In order to facilitate the connection between ELaRA and other relevant entities, the framework of the future research institute and the collaborative partnership and the knowledge exchange flow is detailed in the main ERI application and is summarized in the following figure:



- *Ongoing collaborative projects:*
  - UNITAR – TUDublin

- Stanford University (collaborative partnership TUDublin- Stanford UTCN

The collaborative partnerships will be established based on the research directions and objectives in order to facilitate the transdisciplinary process detailed in the first deliverable D3.4.1. General Installation Layout.

5 - Fund raising proposal

- This task is led by CUT and UPCT. According to the bid, in t3.4 we have to achieve at least one funded project by the end of the first phase of the EUt+ initiative. With the contribution of all partners but our core member, Maria Victoria Soule (CUT) had written the application and, we succeeded to have a **ERASMUS + project «Transformative Digital Pedagogies for Higher Education» TDP4HE *Nr. 2022-1-LV01-KA220-HED-000085277*** that received funding from the EC. All the members of ELaRA worked together to realize the project but, because of the EC requests 3 EUt+ partners decided to be part of the second proposal, so to increase the chances to have the application found. Because this proposal was a real success, the theoretical framework and the objectives were detailed on the third day of the present Summer School by RTU - Dr. Paed., prof. Velta Ļubkina Senior expert in didactics of HE; project manager.

  - The second proposal of t3.4. in order to achieve t3.4 indicators formulated in the EUt+ project application, our bid, will be submitted in March, 2023. This proposal is led like the previous one. The project focuses on Axis 3 formulated in the bid, which has been updated based on common work of core members: Axis 3 (A3): ***Educating students, teachers and researchers to become smart educators with regard to the role of technology in society including ethics and professional development*.**

6 - Communication and organization

- This task is led by TUS and UTT. As a result of this task, the present Summer School took place in Troyes, France. Based on this event we planned additional

workshops based on the present activities as will be detailed in the next part of this report.

***** Event 1 (output of Summer School event): Disruptive Thinking event organized by TUDublin and partners**

*****Event 2 (output of Summer School event) based on Summer School, Troyes, 2022 TUS and TUDublin organized a Sofia conference in December, 12-16.**

7 - Theoretical research framework.

- This subtask is led by TUCN and RTU. In this task based on our previous work were develop 7 white papers based on the professional interest of 3.4 members, framed around the concept of circular pedagogy. Based on the session dedicated to the conceptual analyses from day 3 of the Summer School the following papers are works in progress and the team will transform them into articles for publication in the next period and presented in the context of ***Event 1 – Disruptive thinking event – Barcelona, October, 2022***

1. **Advanced Learning Technologies to Accelerate Universities Institutional Cultural Transformation**.
2. **Mind the Gap! Between Tradition and Innovation in the Context of Circular Pedagogy**
3. **Transformative Education through Circular Pedagogy in the Digital Age**
4. **Reconsidering the Visualization of Scientific Information as an Essential Part of the Pedagogical Process in Higher Education**
5. **A Circular Pedagogy for Higher Education**.
6. **Circular Pedagogy for Smart, Inclusive and Sustainable Education.**
7. **The transition towards a pedagogy for transdisciplinarity through exercises (applications) of urban ecology. Assoc. prof. PhD.**
8. **Some Reflections on Education For Sustainable Development**.

This white paper will be developing in teams in order to have articles publish in high impact journals in the next period. The list of authors is open and will be change based on interest and contributions. All the white papers are linked with the new concept of circular pedagogy, transdisciplinarity and sustainability.

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Next Steps

Topic 1

Among the different research projects, research activities and events, ELaRA plans to continue organising the ELaRA summer school. Different sessions, including presentations and workshops will take place during the ELaRA 2023 Summer School. One of those sessions will be led by Dr. Maria Victoria Soule. Dr. Soule is willing to deliver two sessions, including a hands-on workshop, during the summer school with the topic ***Internationalisation at Home in the Post-Pandemic World*** (with the acronym **EPOS**)

The sessions are part of the Cyprus University of Technology postdoctoral research programme (*METADIDAKTOR*) that was awarded to Dr Soule by this institution. The training programme will be available in webinar formats and/or hybrid format which will enable a larger audience to participate in the training.

Programme content:

The content of the training programme aims to develop the necessary skills for academic staff so that they can integrate IaH practices in their curriculums. Given the different fields of study of the target audience, the programme content will be illustrative and straightforward for its execution, serving as a primary tool for the educators. The structure of the training programme will consist of two different but interrelated learning pathways. The first learning pathway will be theoretical oriented where the state-of-the-art of IaH will be presented. The second learning pathway will be practical oriented, and it will be designed to help academic staff to implement IaH practices following a case-based learning methodology.

Training programme

The training will consist of two sessions where the research findings of the EPOS project will be presented, followed by a hands-on workshop. Two synchronous online and/or hybrid training will be run. Feedback will also be collected from the audience. The sessions will be recorded online with the aim of producing electronic (video) versions of the key parts of the training and make them available as OERs.

Target Audience

EUt+ Academic Teaching Staff

Duration: 4 hours (two sessions of 120 minutes each)

Topic 2

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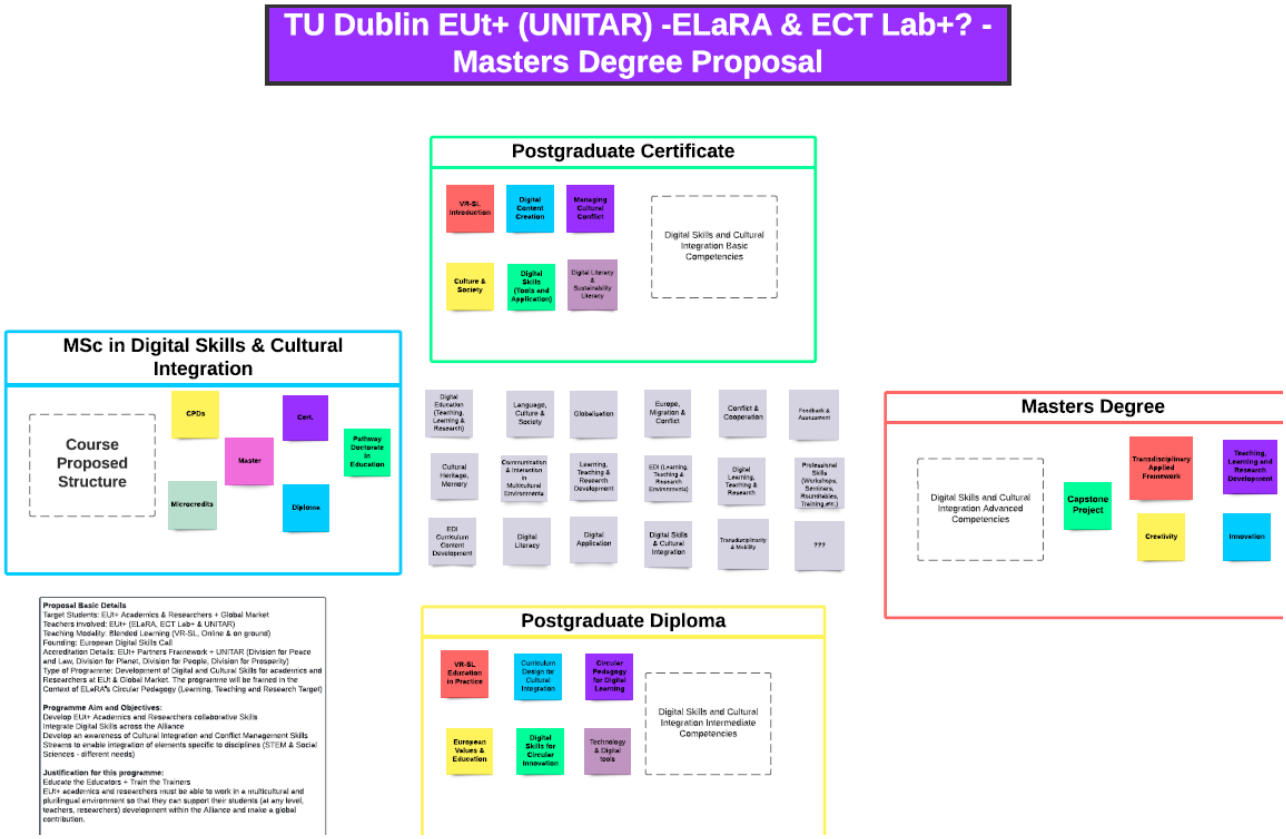
8- Link with other EUt+ work packages

As result of exchanges ideas based on Summer School event TUDublin – UNITAR –UTCN developed a master program presented in next figure:



Topic 3

9 – Research and Academic Training Initiative Proposal by ELaRA team

Initiative led by TU Dublin and Cluj-Napoca

Collaborating Partners: all

Purpose: To articulate EUt+ educational and pedagogical framework

Objectives:

1. Propose EUt+ Pedagogy through a Research Informed Approach (Work initiated in May 2022 through working papers series: Paper 01 and Paper 02 are providing the initial pedagogical framework through the introduction of a novel pedagogy that has been named as: Circular Pedagogy
2. Define EUt+ New Educational Model –The Alliance New Educational Model (ANEM). Work initiated as part of the ERI Application.
3. Support the development of Training and Educational Programmes for EUt+
4. Provide an Open Space for free thinking, collaboration and sharing across EUt+
5. Initiate the Debate between Science and Social Sciences in the context of Education for Sustainable Development.
6. Identify synergies and collaboration with other Working Packages/Research Labs.
7. Promote the development of EUt+ Annual Research event that integrate different research streams aiming to build transdisciplinary research activity grounded/guided by critical pedagogy insights.

Working Paper Series Schedule

Advanced Papers – To be Completed by Spring 2023

- Paper 01 – A Circular Pedagogy for Higher Education
  Prepare for Publication: Spring 2023
- Paper 02 – Circular Pedagogy for Smart, Inclusive and Sustainable Education
  Prepare for Publication: Spring 2023

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- Paper 03 – Advanced Learning Technologies to Accelerate Universities Institutional Cultural Transformation – research paper linked to the proposed Masters Programme

Work in Progress – To be Completed by September 2023

- Paper 04 – Circular Pedagogy for Smart Education and Sustainable Development
- Paper 05 – Science meets Pedagogy at Technological Universities
- Paper 06 – An Open Living Lab for Sustainable Digital Education – Insights from Technological Universities
- Paper 07 – Education for Sustainable Development: What, Why and How in the Context of EUt+
- Paper 08 – Reconsidering the Visualization of Scientific Information as an Essential Part of the Pedagogical Process in Higher Education
- Paper 09 – Transformative Education through Circular Pedagogy in the Digital Age
- Paper 10 – Envisioning the Future of Higher Education – A Student & Teacher Reflection at EUt+
- Paper 11 - Envisioning a plurilingual and intercultural EUt+ educational approach

Handbook or Book – Completed by 2023/2024

Potential Book Title:

"Mind the gap! Between Tradition and Innovation in the Context of Circular Pedagogy: A Multiple Case Study"

- For a **handbook** we need between 25 and 30 chapters. I suggest we start with the book first as see how it goes. However, the handbook could be developed if there is interest across EUt+ to provide insights that are linked to Education for Sustainable Development that enables integration of a broader array of topics.
- For a **book** we need between 12 to 15 chapters. We have 8 chapters if we consider a case study per University at EUt+. We can move this up to 12 papers by elaborating on a critical discussion considering the following structure:

  Chapter 01 – Introduction – A Circular Pedagogy for Technological Universities

  Chapter 02 – Tradition and Innovation at EUt+

  Chapter 03 – Circular Pedagogy to break the Teacher-Researcher Barrier

  Chapter 04 – Cultural Integration for Transformative Education

  Chapter 05 – Technical University of Sofia, Bulgaria – work in progress

Chapter 06 – Technical University of Cluj Napoca, Romania – work in progress

Chapter 07 – Cyprus University of Technology, Cyprus – work in progress

Chapter 08 – Universidad Politécnica de Cartagena, Spain – work in progress

Chapter 09 – Technological University Dublin, Ireland

Chapter 10 – Darmstadt University of Applied Sciences, Germany

Chapter 11 – Riga Technical University, Latvia

Chapter 12 – Université de Technologie de Troyes, Francia

Chapter 13 – A New Learning, Teaching and Research Paradigm for EUt+

Chapter 14 – Conclusions

The book can integrate elements from work done by colleagues and students in other working packages and that link to ELaRA's areas of interest.

VI. Appendices – cluster of tools and files

1.ERI Application

Application

In November 2021 the partners of the European University of Technology (EUt+) Alliance signed a Memorandum of Agreement to enable the foundation of EUt+ Research Institutes (ERI). For an institute's constitution an application and proposal of the Institute has to be submitted to the Steering Board Research. In the following document the required description is presented.

The name of the EUt+ European Research Institute is [**TESST**].

For creating the Institute [**NUMBER**] of the eight EUt+ partners are involved:

- o University of Technology of Troyes, UTT
- o Darmstadt University of Applied Sciences, HDA
- o Riga Technical University,RTU
- o Technological University Dublin,TUD
- o Technical University of Sofia, TUS
- o Cyprus University of Technology,CUT
- o Technical University of Cartagena,TUC
- o Technical University of Cluj-Napoca.TUCN

This application is submitted by [**NAME, AFFILIATION**] on [**DATE**].

[**NUMBER**] researchers of EUt+ are the founding members of the Institute.

TESST

(European Research Institute in **T**echnological **E**ducation for **S**mart Development, **S**ustainability and **T**ransdisciplinarity)

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1. Mission Statement

Our mission is to create a learning environment that will provide scientific knowledge in an open, inclusive, equitable manner that encourages critical thinking, creativity and innovation through effective understanding and communication within, between, and beyond disciplines, supporting cultural resilience and promoting a diverse approach to co-create and disseminate knowledge. Students, academics and researchers will collaborate to co-create, reimagine, and challenge existing educational models. We believe that teaching, learning and research are all part of a whole in University life. Our environment will strive to gain new insights into multicultural, intercultural, transnational and transcultural competencies that help to broaden our learners' lifelong learning journey.

- Core themes of research:

  Axis 1 (A1): Design innovative student-centered pedagogies to promote self-directed, lifelong learning in technological Education that develop the learner as a person by promoting intellectual development, creativity, problem solving and cultural awareness framed by the Universal Design for Learning (UDL) principles. (UNESCO Report 1997/8)

  - Axis 2 (A2): Change in higher Education, changing epistemologies and teaching practice, smart educator development and methods to facilitate evolution.

  - Axis 3 (A3): Educating students, teachers and researchers to become smart educators with regard to the role of technology in society including ethics and professional development.

  - Axis 4 (A4): Broadening participation in technology education by increasing minority participation and recruiting from a broader spectrum of society to embed equity, diversity, inclusion and belonging in our University and in so doing transform society

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- Axis 5 (A5): Identify and integrate critical competencies and/or skills to create value, change and impact as part of the teaching, learning and research process to enable Education for Sustainable Development (ESD).

2. TESST Vision

Today, we are facing unprecedented problems and threats, we are determined to prepare our students for the challenges of the future, across different disciplines, knowledge and cultures. Our philosophy is rooted within the Humboldt idea of a University in which students and teachers learn together in interchangeable roles, united by a common pursuit of knowledge, co-created.

This proposal aligns with the EU agenda for higher Education to build inclusivity and ensure that graduates leave higher Education with the skills they need (European Commission, 2017).

Humboldt argued that a university should be a place for addressing questions for which no tailor-made answers are available, as well as a place to produce new knowledge. In the pursuit of knowledge, the boundaries between student, teacher and researcher blur - all are engaged in a common quest of generating new insights. The process of learning fully coincides with a process of enquiry (Pritchard, R.,2004). The Humboldtian university is also a place that educates future citizens through the development of critical thinking skills to better support society. In the Humboldtian sense, we use the term '***smart educator'*** as someone who can switch roles between student, teacher and researcher – as all will navigate between these roles in their Education. Thus, all at University are equally engaged and eager to reach a deeper understanding of both higher order questions and new insights.

Keeping these aspects in mind and because the EUt+ is an alliance of eight Universities, which means different backgrounds, identities, languages and multi-culturalism, we must create a space in which we could offer the proper conditions for running transformative approaches (OECD,2018 ; OECD, 2019 ; OECD 2020 ; Arbeiter & Bučar, 2021 ; UNECE, 2011 ; UNESCO, 2021; UNESCO, 2021) and innovative practice in order to facilitate new learning environments for all students and teachers following the four main pillars of Education : Learning to know, Learning to do, Learning to be and become, Learning to live together (Delors, 1996 ; UNECE,2012 ; UNESCO, 2021).

For Education to become future proofed we need to move beyond the 'silo' of the individual discipline towards a transdisciplinary approach to bring real world problems into our teaching. (*Balderas et al, 2018*). This engagement with wider society in a collaborative manner allows our Education to serve society's needs including finance and economics vital elements, and bring a focus to experiential learning (Wiggins, 1998).

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This collaborative method will allow the students to engage with shared real life challenges. The engagement of collaborative 'real life' challenges emphasises meaningful student learning through applied, active learning that draws on multiple knowledge sources (academic, student knowledge and experience, industry and community knowledge) and provides students with ample opportunities for ethical and critical reflection (Boud, 1985; Biesta, 2013). This in turn impacts positively on student learning, motivation, self-regulation and metacognition (Villarroel, Bloxham, Bruna, Bruna & Herrera-Seda, 2018).

The EUt+ is currently comprised of 8 countries representing a total of 9 national languages. These national languages are the vehicles of our identity, behaviour and cultural perception. As we communicate in each of our nation state's language(s), our members connect with their cultural heritage, build their collective and individual identity and better understand the contribution of their national or regional culture to the Alliance as a whole. However, in the globalisation era, some 'international languages' are dominating, leading gradually to a language oligopoly at the expense of other less widely spoken languages. The European language capital is at risk of impoverishment. Protecting Europe's linguistic capital is essential to avoid cultural dilution, to strengthen European identity, culture and creativity and to promote mutual understanding and social inclusion, which serve social, economic and political stability in Europe. The EUt+ has an important role in proposing an educational model that respect all the languages and avoid the predominance of languages such as English and the preservation of all our partners' identities as expressed through their individual languages

Our environment intends to engage in transformative educational research through a multi-paradigmatic design approach. Anchored within the Piaget model of learning methods it will use Kincheloe's bricolage concept to allow flexibility and also ensure a rigour to our research methods (Kincheloe et al., 2017). Our ambition is to go beyond disciplinarity, multidisciplinarity and interdisciplinarity and to create the proper conditions for transdisciplinary to appear.

According to OECD (2020, p.12), transdisciplinary approaches should be used to address to social challenges at the level of University and Public Research Institutions.

Transdisciplinarity will be our broad theoretical framework/guide (Nicolescu, 2010) which will use the flexibility of different approaches and unite them to create new knowledge.

In this regard: "*transdisciplinary is not concerned with simple transfer model of one branch of knowledge to another, but rather with the study of isomorphism between the different domains of knowledge…. transdisciplinarity takes into account the consequences of a flow of information circulating between the various branches of knowledge, permitting the emergence of units amidst the diversity and diversity to the unit. Its objectives are to lay bare the nature and characteristic of this flow of information and its principal task is the elaboration of a new language, a new logic, and new concept to permit the emergence of a real dialogue between the specialist in the different domains of knowledge (Nicolescu, 1996)*".

In the context of EUt+ but also in the context of stringent global concerns it ***is essential to follow an open approach because inclusiveness is not only putting together students from different countries,***

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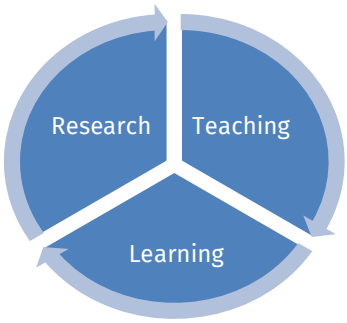
but it is also being aware of the fact that people have different perspectives and perceptions of reality and those different perspectives are complementary, not contradictory to each other, and must be valued.

The transdisciplinary worldview is based on three axioms of the methodology of transdisciplinarity:

> " *1. The ontological axiom: There are, in Nature and society and in our knowledge of Nature and society, different levels of Reality of the Object and, correspondingly, different levels of Reality of the Subject.*
>
> *2. The logical axiom: The passage from one level of Reality to another is ensured by the logic of the included middle.*
>
> *3. The complexity axiom: The structure of the totality of levels of Reality or perception is a complex structure: every level is what it is because all the levels exist at the same time (Nicolescu, 2010)".*

In the light described above, the transdisciplinary approach is an ***open worldview***, which allows all methodological frameworks present in Educational Sciences field (Cohen, Manion, Morrison, 2018) to be ***valuable and welcome to contribute to a better understanding of our world, life, and a smarter future***.



3.Objectives

In line with our mission statement and vision for **smart educators** TESST's objectives are:

- to **build cultural resilience** by promoting a continuous process of change and transformation. By cultural resilience we understand" *the ability of cultural systems to absorb adversity, deal with change and continue to develo*p (Holtorf, 2018)".
- to promote democratic culture by developing educators'/students'/teachers' and researchers' **plurilingual and intercultural competences** as an essential dimension of their pedagogical competences (in line with Recommendation CM/Rec(2022)1 of the Committee of Ministers to member States on the importance of plurilingual and intercultural education for democratic culture)
- to develop **evidence-based strategies and impact on policies** that empower EUt+ stakeholders to create a plurilingual Alliance in which all national languages of the Alliance can harmoniously coexist and benefit from equal treatment, both in its educational and research activities
- to **connect and merge research, teaching practice and learning**.
- to **create a culture of evidence-based practice** which informs the cycle of teaching, learning and research as the signature of EUt+.
- to **design and test new learning models**, teaching methodologies, innovative teaching devices, and inspirational teaching tools, underpinned by an iterative research approach at a European scale with shared methodologies and continuous exchanges.
- to **support educators/ students/teachers and researchers** in their collaborative processes in creating this new model
- to **empower students**, by putting them at the centre of the conducted research, by taking into consideration and emphasising the value of students' initiatives, as well as by reflecting on the best ways to fulfil the students' paradigms in a holistic worldview and on the best ways for them to develop their knowledge and skills.
- to **share best practices and knowledge** for the purpose of consolidating transformative and innovative methods of teaching, to broaden our horizons and to improve the teaching skills and professional development of all educators, so they can adapt their practice to the increasingly fast changes in the contemporary world.
- to **bring out the best** (on the scale of the effectiveness, efficiency, satisfaction of the participants in the process) from the respective national pedagogical systems, and on the grounds of the national achievements, to build a transnational, pan-European / common European "pedagogy of action" that would resonate with the practical needs and would be adequate to the needs of the present and the future.
- to ensure a **better circulation and visibility** of scientific knowledge by providing equity of access to Education.

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4.Aims

Our original four objectives have now been updated and expanded to five axes of research, where the traditional divisions of research, teaching and learning are envisioned as being interchangeable. In our model we use the term: '**Smart Educator'** as a researcher, teacher and student who assumes each of these roles in the proposed education model. In our view a 'smart educator' is not just limited to the use of technology but enables regaining consciousness of the humanistic dimension of Education in a holistic sense, paying attention to the learners' complex environments and particularities.

4.1. Core actions to achieve the aims described in the axis and becoming a ***smart educator***

Within the European Union, key competencies are defined as critical skills that are needed to live in a contemporary knowledge society (UNECE, 2011; UNESCO, 2015). Based on the Delors Commission report of 1996, the new vision of education is based on two main ideas: **lifelong learning and the four pillars of learning: to know, to do, to be and to live together**.

In this light, the competencies for educators in education for sustainable development as core actions will be explored and tested according to UNECE description (UNECE, 2011):

- **Pillar 1:** Learning to know
  - **I.** **Holistic approach** - The holistic approach includes three interrelated components: a Integrative thinking; b Inclusivity; c Dealing with complexities. These three components are detailed in terms of goals for all educators to understand: (a) The basics of systems thinking ways in which natural, social and economic systems function and how they may be interrelated; (b) The interdependent nature of relationships within the present generation and between generations, as well as those between rich and poor and between humans and nature; (c) Their personal world view and cultural assumptions and to seek to understand those of others; (d) The connection between sustainable futures and the way we think, live and work; (e)Their own thinking and action in relation to sustainable development – integrative thinking and practice
  - **II.** **Envisioning change** – All educators will understand and be aware of the relation between past present and future regarding: (a) The root causes of unsustainable development ; (b) The fact that sustainable development is an evolving concept; (c) The urgent need for change from unsustainable practices towards advancing quality of life, equity, solidarity, and environmental sustainability; (d) The importance of problem setting, critical reflection, visioning and creative thinking in planning the

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future and exacting change; (e) The importance of preparedness for the unforeseen and a precautionary approach; (f) The importance of scientific evidence in supporting sustainable development.

III. **Achieve transformation of people, pedagogy and education systems** – Achieving transformation covers competences that operate at three levels: 1. Transformation of what it means to be an educator; 2. Transformation of pedagogy, i.e., transformative approaches to teaching and learning; 3. Transformation of the education system as a whole. In this regard all educators should realised: (a) Why there is a need to transform the education systems that support learning; (b) Why there is a need to transform the way we educate/learn; (c) Why it is important to prepare learners to meet new challenges; (d) The importance of building on the experience of learners as a basis for transformation; (e) How engagement in real-world issues enhances learning outcomes and helps learners to make a difference in practice.

- **Pillar 2:** Learning to do.
  - I. **Holistic approach: the educators have the ability for** Integrative thinking and practice in order to**:** (a) Create opportunities for sharing ideas and experiences from different disciplines/places/cultures/generations without prejudice and preconceptions; (b) Work with different perspectives on dilemmas, issues, tensions and conflicts; (c) Connect the learner to their local and global spheres of influence
  - II. **Envisioning Change**: **the educators have the ability to analyse the past, present and futures alternatives in order to:** (a) Critically assess processes of change in society and envision sustainable futures; (b) Communicate a sense of urgency for change and inspire hope; (c) Facilitate the evaluation of potential consequences of different decisions and actions(d) Use the natural, social and built environment, including their own institution, as a context and source of learning
  - III. **Achieve transformation of people, pedagogy and education systems: the educators have the ability to realise:** (a) Why there is a need to transform the education systems that support learning; (b) Why there is a need to transform the way we educate/learn ; (c) Why it is important to prepare learners to meet new challenges; (d) The importance of building on the experience of learners as a basis for transformation; (e) How engagement in real-world issues enhances learning outcomes and helps learners to make a difference in practice.
- **Pillar 3:** Learning to be
  - I. **Holistic approaches**: The educators are people who need to develop a high level of Integrative thinking and practice in order to promote inclusiveness of different disciplines, cultures and perspectives, including indigenous knowledge and world views.

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II. **Envisioning Change**: the educators are motivated to make a positive contribution to other people and their social and natural environment, locally and globally are willing to take considered action even in situations of uncertainty

III **Achieve Transformation of people, pedagogy and education systems:** the educators will be (a) willing to challenge assumptions underlying unsustainable practice; (b) facilitators and participants in the learning process as a critically reflective practitioner; (c) inspirational for creativity and innovation; (d) engaged with learners in ways that build positive relationship.

- **Pillar 4:** Learning to live together
  - I. **Holistic approaches:** The educator works with others in ways that actively engage different groups across generations, cultures, places and disciplines.
  - II. **Envisioning Change:** The educator works with others in ways that facilitate the emergence of new worldviews that address sustainable development and encourage negotiation of alternative futures.
  - III. **Achieve Transformation of people, pedagogy and education systems:** The educator works with others in ways that (a) challenge unsustainable practices across educational systems, including at the institutional level and (b) help learners clarify their own and others worldviews through dialogue, and recognize that alternative frameworks exist.

The core actions for key competences will be framed and detailed in the agenda for the research section. The list of the research project represents only a starting point and an output of our joint efforts to create and facilitate proper conditions for a better future.

5.Agenda for research

Based on these axes we set out our research agenda guided by five core research directions as follows through the projects described below:

5.1.Research Direction 1: Education for Sustainable Development

This direction will identify core competencies associated with ESD framed on European values to support the development of teachers, students and researchers that inform the new Institute's pedagogical approach for curriculum innovation to acknowledge the urgency of sustainable education cemented on the importance of peace building and peacekeeping that are critical for sustainable development. We recognise the need for continuously updating competencies as societal requirements for new competencies markedly differ from needed skills about thirty years ago, and even two years ago with the outbreak of the Global Health

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Crisis, the ongoing environmental crisis, the threats linked to the ongoing Russian-Ukrainian war, and other circumstances that represent a direct menace to European countries and values. There is an imperative need for continuous reskilling and upskilling and for education that is grounded on our European identity - Axis (5). This research project will be developed in collaboration with UNITAR to ensure that the UN 2030 Agenda and UNESCO educational principles guide the research process.

1. *Topic 1.1 Educational Model to Promote European Values, Peace Building and Peace Keeping*

   This research project will develop a practical educational framework whose foundations are European values guided by SDG16 (Peace, Justice and Strong Institutions). The European University of Technology will emerge as a strong institution that cherishes peace and justice that becomes an integral part of teaching, learning and research activities.

   Within the European Union, key competencies are defined as critical skills that are need to live in a contemporary knowledge society (UNESCO, 2015)

2. *Topic 1. 2. Competencies and Skills*

   This research project will identify and integrate critical competencies and/or skills to create value, change and impact as part of the teaching, learning and research process to enable ESD. The research will lead to an actionable strategy towards curriculum innovation and its optimal and efficient implementation.

   Within the European Union, key competencies are defined as critical skills that are needed to live in a contemporary knowledge society (UNESCO, 2015)

3. *Topic 1.3. Disruptive Education for Sustainable Development / Transformative Learning*

   This research project will inform our Institute's pedagogy framed on Education for Sustainable Development, guided by the Institute's innovative **Circular Pedagogy** that will lead to the development and creation of synergies between responsible learners, active researchers and conscious teachers by focusing on five core elements:

   - Research, Teaching and Learning nexus

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- Learning Content
- Pedagogy and Learning Environments
- Learning Outcomes
- Societal Transformation

4. *Topic 1.4 Advanced Learning Technologies for Cultural Transformation*

   This research will challenge the concepts of learning, pedagogy, learning outcomes and societal transformations to align them with our Institute's vision, mission and cultural values. The project will provide critical insights on needed cultural transformation/shift at the heart of the educational system to enable the development of the **Sustainable-Smart-Knowledge Economy.** Our circular pedagogy aims to nurture Smart-Educators' development by creating a learning ecosystem that promotes technological innovation, resource efficiency, sustainability and high social welfare as engines for growth, development and success. Our '**Smart Educators**' will actively contribute to developing and consolidating a sustainable European economy by embracing the need for resilient socio-economic systems that provide everybody with a good quality of life and opportunities for quality jobs. We will use advanced learning technologies to promote a cultural transformation that will be cemented on knowledge sharing and exchange practices to ensure that EUt+ make a substantial contribution to economic development by capitalising on scientific discoveries and applied research.

5.2 Research direction 2: Equity, Diversity, Inclusivity & Belonging in Education (A1&2&3&4)

The direction will be organized according to ”living lab” vision (EC, 2022) and will have a physical space located at Technical University of Cluj Napoca, Nord Center Baia Mare. Through this research direction we will examine structure and agency through an evidence based best practice of contextual barriers to participation and progress of learners. In other words, this direction will identify and try to remove the obstacles to more compatible higher education systems applying to EUT+ initiative (EC, 2022). UDL Curriculum design, teaching and assessment methods are critically

explored to support inclusion, equity and the sense of belonging in education. At the same time the direction will throw the lens of inclusiveness, equity and belonging this research direction will promote innovative and transformative approaches for learning and teaching at all levels: Bachelors, Master and Doctoral levels (Axis 2 & 4).

1. Topic 2.1. Digitally-enabled Development of Key Competence for a Sustainable Society: The Personal, Social and Learning to Learn Competence. European Case Studies

This research provides support and sharing of best practices to develop students' soft skills/ competences for 2030 to ensure that technology is used in a sustainable way to support the personal, social and learning to learn competence which can be acquired through formal, non-formal and informal Education and which can help citizens to thrive in the 21st Century (Axis 1, 5)

4. Topic 2.5. The Adoption of Technology in the context of digital age

Transdisciplinary approach to learning appears as a possible perspective for reconfiguring the educational process towards competence formation (Hadîrcă, 2021). Interculturality, information explosion, globalization build thresholds for challenges in education. Learning involves new technologies, and technological creation becomes a support for learning and develops new educational environments. The responsibility of learning in a safe context in relation to technology implies adapting to the challenges for a sustainable education. Digital literacy refers to a society that generally wants to be digitally literate. Further improvement of basic digital competences can be left to the lifelong learning needs of individuals, together with provision for lifelong learning (Keravnou-Papailiou, 2022). Universities generate advanced digital competences that help society adapt to meet its greatest challenges (European Comssion, 2020). Research has demonstrated the value of technology for innovative pedagogies in advancing student-centered learning

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but, yet higher education has not focused the systemic attention needed to scale these approaches starting for the moment of adoption of advanced learning technologies so much necessary for a smart and sustainable education, both for the students and teachers.

The digital age has introduced the need for a new way of preparing students with new competences, new ways of learning and a more flexible culture through opportunity and the need for speed, and smart education allows the organization of advanced learning activities that ensure the development of cognitive motivations, the creation of the foundations of a personal culture, the acquisition of moral values, etc. Innovative pedagogy indicates the scientific study of the smart educator and innovative learning-teaching-assessment processes and aims to educate citizens of the information society in a way that they are creative, allow themselves to change, manage, analyze and work with information (Sedef & Behçet, 2021). The change of technologies in the educational process has led to the emergence of advanced learning in education in general and in the process of initial teacher training in particular (Senovska & Pryshliak, 2020).

Research on technology adoption in education focuses on the conditions that increase or decrease the likelihood that a new idea, product or practice will be adopted by researchers, teachers and students of a particular culture with different attitudes towards new technology. A new technology needs time to gain importance for the students, teachers and researchers. The limitations of the adoption of educational technologies are the lack of information available about the new technology, how it can be used and what it does. Thus, answers are sought to the question: why, if a new educational technology is a real improvement, do the results for adopters seem to be achieved at different intervals, with the same preferences? A first answer is that not all educational agents are informed about the new technology at the same time. Potential users need communication skills with adopters, following a "word of mouth" process of information dissemination. Over time, user experience leads to the spread of knowledge about the existence of technology to non-users who in turn become users. The use of digital technologies is based on the desire to transform the learning process in an advanced one and the need to implement a learner-centred approach to make the teaching-learning-research a circular process. By designing and implementing learning activities based on interactive teaching strategies, teachers and students create an environment that plays a key role in improving metacognitive skills, as digital technologies have the potential to

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support and shape a pedagogy that is more active, participatory, personalised and flexible.

Technology Integration Matrix (TIM) provides a framework for describing and directing the use of technology to enhance learning. The model presents adoption as the second stage in technology integration alongside input (first stage), adaptation (third stage), infusion (fourth stage), and transformation (fifth stage) in corelations to five interrelated characteristics of learning environments: active, collaborative, constructive, authentic, and goal-oriented. Together, the five characteristics of meaningful learning environments and the five levels of technology integration create a matrix of 25 cells, each cell having its own description of technology acceptance related to learning but also with reference to teacher ownership of learning vs. student ownership of learning, procedural understandings vs. conceptual understandings, conventional use of technology tools vs. complex use of technology tools, and instructional focus on tools vs. focus on content (Florida Center for Instructional Technology, 2019).

5. The practice of the transition towards a circular pedagogy for transdisciplinarity in urban ecology –

Transdisciplinarity involves the use of information from several specialized fields and their "melting" in new, higher-order meanings, through processes of increasingly advanced synthesis of cognitive schemes, concatenation and upgrading of scientific perspectives; in terms of the DIKW knowledge hierarchy model, transdisciplinarity involves the mental approach of evolution from disparate data (D and I) to knowledge and wisdom (K, W).

Thus, transdisciplinary contents are not equivalent to an algebraic sum of monodisciplinary knowledge. Similarly, the pedagogical approaches for transdisciplinary approaches, even if they support and start from monodisciplinary ones, are not reducible to them: they have a different specificity, address other levels of mental functioning, assume other stages, claim other skills and aim for other purposes. It's the difference between an algorithmic approach and a creative-heuristic one

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b. University training, to be sustainable, needs mental openness, values and work skills in the spirit of the transdisciplinary approach, a learning of specific practices for teachers/ students/researchers alike. At the university level, the pedagogy that guides the transdisciplinary learning approach is in a stage of fragmentation. For the coagulation of a pedagogy of transdisciplinarity, adaptations of the contents, didactic paths, teaching/learning methods, purposes, particularities of the assessment tools to the transdisciplinary specifics, etc. are necessary:

The purpose of the approach : articulating a circular pedagogical approach to learning in higher education for transdisciplinarity.

The objectives such actions are:

- the proposal of a pattern of constitution of the transdisciplinary conceptual body
- identifying the stages and their sequence within a transdisciplinary pedagogical approach
- decanting a body of effective teaching/learning methods for the transdisciplinary approach
- the identification of patterns of learning goals specific to the transdisciplinary approach
- building some methods/tools for evaluating the results of the learning activity

The pedagogical framework of the project

Using a mixture/ melting of educational perspectives:

- Universal learning design, social constructivism, the DIKW model of informational structuring, experiential learning, transformative learning circular pedagogy, collaborative learning, games-based learning and gamification. etc.
- the use of a technological diversity - wearables, coded devices, augmented reality, social media, tablets (iPads), student-owned devices (BYOD), student-generated multimedia, cloud technologies, mobile games and apps, enterprise-wide mobile platforms, the Internet of Things and sensors) but also some models of technological integration in classes (eg the SAMR model, TPACK framework).

Guidelines for the learning process:

- Learning by constructing new meanings

- The need to multiply and nuance representations
- critical reflection
- The value of co-learning
- The value of personal experience and increasing student engagement
- Adaptive teaching
- value-based learning

The transdisciplinary field of study to which the pedagogical approach will be applied is urban ecology for students.

6. Topic 2.6. Universal Design for Learning for All in the context of Inclusivness, equity and belonging in education

In many countries, inclusive education is still thought of as an approach to serving children with disabilities within general education settings. However, internationally it is increasingly seen more broadly as a principle that supports and welcomes diversity among all learners. This means that the aim is to eliminate social exclusion that is a consequence of attitudes and responses to diversity in race, social class, ethnicity, religion, gender, sexual orientation, migrant status and ability. As such, it starts from the belief that education is a basic human right and the foundation for a more just society.

In an education system based on the principles of inclusion and equity, all students are assessed on an ongoing basis in relation to their progress through the curriculum. This allows teachers to respond to a wide range of individual learners, bearing in mind that each learner is unique. In particular, there have to be sensitivities regarding the cultural, ethnic, and linguistic backgrounds of students. At the same time, it is essential to create safe and inclusive learning environments which are free of violence and discrimination of any kind.

This means that teachers and other professionals must be well informed about their students' characteristics, interests and achievements, while also assessing broader qualities, such as their capacity for cooperation. However, the ability to identify each student's level of performance is not enough. Teachers in inclusive systems need to gauge the effectiveness of their teaching for all of their students and should know what they need to do to enable each student to contribute and learn as well as possible.

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In order to follow the SDG 4, this research direction will be organized according to the "living lab" vision (EC, 2022) and will have a physical space located at the Technical University of Cluj-Napoca, North Center Baia Mare.in collaboration with Cluj campus. This research direction will be oriented to examine structure and agency through an evidence based best practice of contextual barriers to participation and progress of learners. In other words, this direction will identify and try to remove the obstacles to more compatible higher education systems applying to the EUT+ initiative (EC, 2022). Universal design for learning (UDL) Curriculum design, teaching and assessment methods are critically explored to support inclusion and equality and the sense of belonging in education. At the same time the direction will throw the lenses of inclusiveness, equity and belonging this research direction will promote innovative and transformative approaches for learning and teaching at all levels: Bachelors, Master and Doctoral levels.

5.3. Research direction 3: Transdisciplinarity in and for Education

Through mixed research methods real educational contexts are examined resulting in the development of an object, activity or process. This design process can in turn be used in other contexts such as combining disciplines as diverse as psychology and engineering with an iterative process at its core. (Axis 1 & 3)

1. Topic 3.1. Drawing on transdisciplinarity - A proposal for action: needs-reflection-dialog-self-reflection-presentation-dialogue Multicultural societies - Multicultural universities - Multicultural REALITIES.
2.

5.4.Research direction 4: Building Teachers competencies to support the transition to smart Education

The research encompasses axis 1 & 2 through the use of experience sharing and knowledge transfer combined with the development and utilisation of a new assessment system of pedagogical competencies of academic staff, in the context of being an effective **'smart educator'.**

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1. Topic 4.1. To promote the implementation of the already existing methodologies in the practical activities of RTU teaching staff and to develop innovative student-centered methodologies for the improvement of the study process;

2. Topic 4.2. To ensure the development of self-assessment tools and a platform for the assessment and improvement of the pedagogical competencies of the academic staff;

3. Topic 4.3. To ensure students' participation in technological Education, including professional ethics and professional development.

5.5. Research direction 5: Transforming the Teacher to become a Smart Educator

Develops appropriate European models appropriate to the discipline which will also encompass technology in their training (Axis 2,3).

1. Topic 1: Developing a European model for higher education teacher training

For several years now, teaching and learning methods have changed significantly: the rise of digital education, the COVID crisis, distance learning and hybridization of pedagogical models, student profiles, etc. It therefore seems essential to rethink and constantly adapt our pedagogical practices, and to provide higher education teachers with the tools they need to ensure that their pedagogical skills are adapted to the training challenges of tomorrow. To do this, we would like to think about a European training program for higher education teachers that would be inspired by the best pedagogical practices and training programs developed by the 8 partners of the consortium. The main objective is to create an original and unique European model of higher education teacher training and to be able to promote it on an international scale.

2. Topic 2. Developing a European model of technology training

In many university curricula, technology finds its place as a practical application of fundamental teachings. In the context of the highly technological environments in which we are evolving and given the ecological and societal challenges that await us, it is important to think the technology as the

central pillar of our training so that students are equipped to face the challenges of tomorrow. Placing technology at the center of our training requires to rethink our training models by developing new pedagogical methods: project approach, modular and personalized teaching, mentoring of students, technological projects applied to societal needs, interdisciplinarity... A research work could be carried out in order to gather or create the most innovative and efficient pedagogical methods to consider a European model of technology teaching.

3. Topic 3. Transformative Digital Pedagogies (ERASMUS project – CUT, RUT, UPCT, TUDublin, UTT)

The research project is entitled Transformative Digital Pedagogies for Higher Education (TDP4HE). The main objective of the TDP4HE project is to empower academic teaching staff with transformative digital pedagogies competences. For this purpose, the project aims to create a scientific basis for the identification and assessment of pedagogical competences of educators; guide and advise educators on the selection, critical use, and design of transformative digital pedagogies ; and develop a community for the exchange and spread of innovative teaching practices in HE across Europe. The TDP4HE project will create a focus group for the co-construction of a new self-assessment framework of academic staff competences on transformative digital pedagogies (TDP); organise three hybrid events for the presentation of the project results; implement two series of a training programme dedicated to TDP emphasising the role of educators on social transformation; develop a virtual space for Open Educational Resources (OER) and Open Educational Practices (OEP) users; and create an open community of practice platform. The main deliverables of the TDP4HE are: The TDP4HE self-assessment framework of academic staff competences on transformative digital pedagogies (TDP) and e-Tool; Webinars from the training programme on TDP; a digital trainer's guide with practical instructions and advice on how to implement training on TDP; an e-Toolkit with OER and OEP; the TDP4HE open community of practice platform where the academic community can have access to the project resources and interact with peers by sharing their teaching practices and their own OER/OEP.

4. Topic 4 Training and secondment for postgraduate master-by- research and doctoral student (ERASMUS project - work in progress.

Recent studies (DETEL Report, 2022) have shown that despite the fact that PhD students have received training in research methods, they still claim more tailored training in research methods such as design-based research (DBR), experimental research, qualitative and quantitative methods

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and computer science methods. We believe that graduate students from technical universities could also benefit from a tailored programme designed to support them in their research practices.

Objectives

Obj 1: To create a scientific basis for the identification and assessment of graduate students' (of technical universities) needs in terms of research practices.

Obj 2: To support graduate students (MA and PhD students of technical universities) through their research career by providing in-depth knowledge of research methods as well as other research skills to succeed in the academic world.

Obj 3: To design a new programme in best research practices for graduate students of technical universities. The programme will include live sessions in the format of hands-on workshops focusing on academic writing, research methods (DBR, quantitative research, qualitative research, mix-methods, etc.). The programme will also support students in the development of their research presentation skills (e.g. different forms of conference presentations, research publications, etc.)

Obj 4: To support graduate students in the process of connecting with the industry and promoting possible business ideas generated from their research.

Obj 5: To create a community of practice for graduate students where they can interact and share their work, ideas on research methods, etc.

This project will be submitted by March 2023

6.Strategic Plan

TESST aspires to become one of the most prestigious research institutes not only within the EUt+ alliance but also within Europe and globally. Our strategic goal is to conduct high quality, state-of-the-art research in Education that would bring forward innovations in the field and eventually contribute to the body of knowledge. Building on the five research axes, as presented in section 4 of this application, the eight Universities of the alliance will work together collaboratively to help the research institute become established and flourish.

A long-term goal of TESST is to spread its wings beyond European levels to increase the lab's recognition and activity and help engage its members into collaborative research projects. Academic members of TESST who pursue mutual research and educational interests with academic faculty outside the EUt+ alliance can form partnerships that will initiate professional and internship opportunities for students but also the creation of ground-breaking research frameworks and

outcomes that can be applied in many disciplines. This initiative will help establish TESST as one of the most prestigious research institutes on a global scale.

In order to achieve these goals, the strategy plan contemplated by TESST includes the following actions:

- Active participation and commitment of all its members in the Institute's projects and activities.
- Promotion of the Institute's activities to gain international visibility, and in turn, increase the Institute's capacity to attract funding.
- Constant search for funding opportunities to advance and build innovative research.
- Development of programmes that facilitate collaboration and strengthen the impact of research and innovation to tackle educational challenges.
- Constant pursuing and setting up of educational and training projects involving both teaching staff and students.
- Constitution of an internal evaluation committee for the Institute's actions/outputs/achievements. This committee will evaluate whether all the Institute's actions are in line with the EUt+ guiding principle "*Think Human First*", and particularly, whether they adopt the alliance's conception of the role of technology in the 21st century.
- Provision of support to early stage career researchers within the Institute and creation of an institute research school with the focus onto the designated field of research to facilitate and foster dedicated training and mobility programmes. Thus, supporting a multicultural and multilingual approach.
    - Creation of: "***living labs"*** based on research directions and focus on transformative and transdisciplinary approaches in order "*to promote good example of how students can be trained to work on challenges in a holistic way, across disciplines, and how to support students" critical thinking, problem –solving, creative and entrepreneurial skills* (EC, 2022, pp. 8).
    - Promote synergies between education area and research area
    - Create a framework of ***future-proof education*** under EUt+ initiative (EC, 2022)

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During the first five years of its establishment, TESST research will focus on the research agenda as presented in section 5 of this application. This list with the Research Directions set by the founding members of this Research Institute is not extensive and may be updated and enriched with more research topics. All TESST research endeavours will be supported by both internal bodies' feedback/ reflection (TESST members, Steering Board Research, the board of EUt+) and external feedback/ reflection (EUt+ European Research Office) that will ensure the quality of the research conducted by the Institute. This process of reflection will lead to the development of an iterative approach to ***inclusive teaching and learning informed by research***.

Each project will therefore go through a series of improved iterations. This will lead to a refinement of both the technology needed to teach and the teaching of technology over the five year period. It will lead to the establishment of new models of teaching and learning with an extensive toolbox of ideas and methods all underpinned by rigorous research.

For the completion of the research agenda, TESST will establish partnerships with different external bodies, as seen in the Figure below. More specifically, our Institute will set partnerships with other Universities, the Industry, different Government bodies, Community groups, NGOs, International Organisations, Educational institutions from all levels of Education, etc. This will allow the expansion of the global reach of our Institute. Transdisciplinarity will allow us the freedom to develop new innovative student-centered approaches to teaching, learning and research within a supportive overall structure. These projects are designed with the education process with pursuit of knowledge as the driving force. Leading to the improvement of teaching and learning experiences both within the EUt+ and globally.

Our TESST institute will establish Clusters of Universities working together on these projects and they will be supported with external reflection to ensure that critical distance is included in the process.

We will share best practice, and critical reflection of our outputs. This reflection will develop an iterative approach to inclusive teaching and learning. This educational process in which teachers and students co-create knowledge, through Democratisation of Learning where roles are interchangeable.

Some of the projects will include international partner Universities which will expand the global reach of our Institute. Transdisciplinarity will allow us the freedom to develop new innovative student-centered approaches to teaching, learning and research within a supportive overall structure. These projects are designed with the education process pursuit of knowledge as the driving force.

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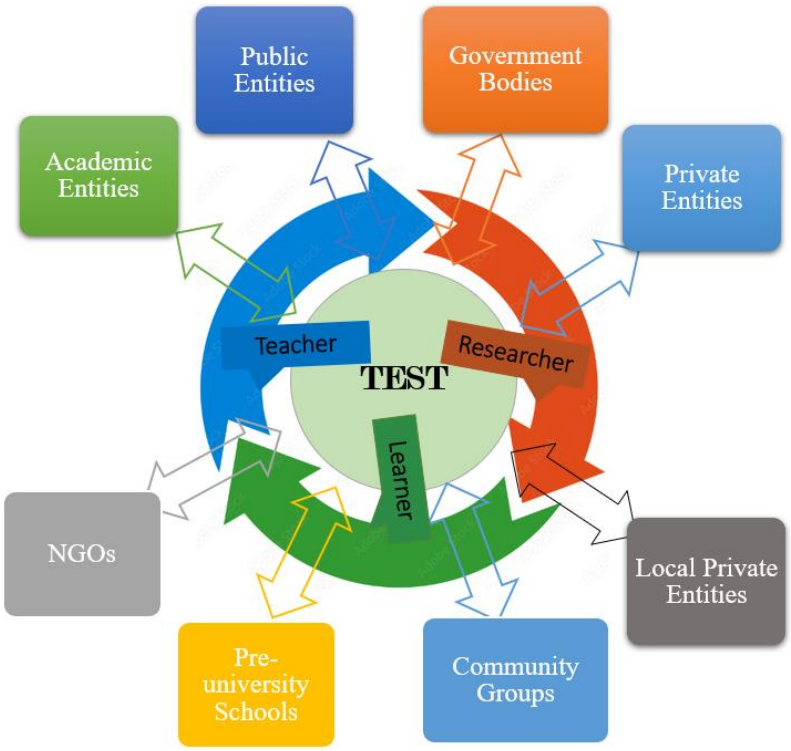
Collaborative Partnership Diagram - Smart Educator



At the core of our activity, the institute will hold “living labs” in order to get data from different views, contexts, and methodologies, in order to identify new solutions based on triangulation procedures, do the transfer of knowledge between different branches of knowledge and study of isomorphism between the different domains of knowledge. This new structure will be an engine for innovation and solving societal challenges through a new framework of learning and teaching research. This will be concretized in a new approach to the educational process supported by specific guidance material; Handbooks; Concrete Packages/deliverables based on evidence; Future-proof education Toolkits (peer learning scenarios and identification on good practice) (EC, 2022) and Toolkits for supporting resilience of the alliance.

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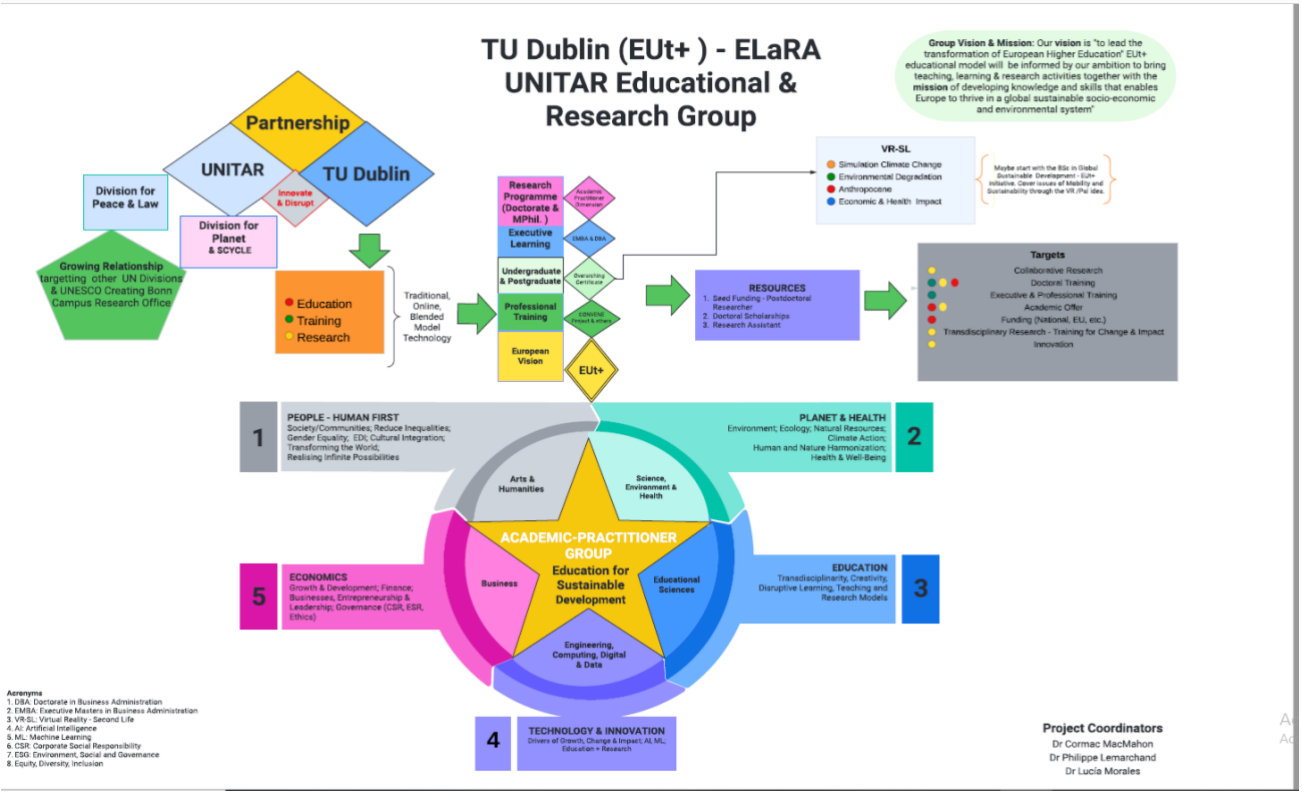
Proposition 1



7.Activities for first five years

We intend to commence the first 11 projects described in section 5 within the first year. The core objective is to create transdisciplinary teams that are guided by the institute principles for equity, diversity and inclusivity. These projects vary in length but all will share the common approach of implementation, review, critical reflection and second improved iteration.

To support this we will need technological support to enable this sharing of ideas and projects with an external observer from other EUt+ members. That way all members of the EUt+ will be involved and have a voice in the sharing of knowledge. We will need adequate research spaces that foster creativity, imagination, dialogue and debate with appropriate tools to communicate and engage on multitask working environments.

The projects rely on mobility of staff and engagement of researchers and postgraduate students to ensure these goals are achieved. Mobility of the institute members emerges as a critical element to facilitate understanding the Alliance different cultures, socio-economic environments, learning

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spaces and to enable a better understanding of every individual within their social and institutional structures that will inform the way that we work and interact.

The frequency of reports on progress will depend on the milestones set by each project team.

7.1. Activity plan for of the next five

	Year 1 **(2022-2023)**	**Year 2** **(2023-2024)**	**Year 3** **(2014-2025)**	**Year 4** **(2025-2026)**	**Year 5** **(2026-2027)**
Installation and deployment of the Institute	Setting up the governance of the Institute (management committee) Creating and connecting physical spaces dedicated to pedagogy in partner universities Creating and running a doctoral school allowing the opening of PhD and post-doctoral positions Creating networks by establishing communities of practice (CoPs) for academics and students Teacher training on new pedagogies Student training on the improvement of learning skills				
Indicators (KPIs)	Research projects Design and delivery of a series of Webinars for teachers Design and delivery of a series of Webinars for students Creation of OERs (Open Educational Resources) Creation of a virtual community for the academic staff Creation of a virtual community for the academic staff Events Presentations at Conferences Publications Mobility for teachers Mobility for students				
Research activities	Research projects around the 5 axes of research of the Institute Indicators : at least 1 research project linked to 1 applied educational project	Research projects around the 5 axes of research of the Institute **Indicators:** at least 2 research projects linked to 2 applied educational projects	Research projects around the 5 axes of research of the Institute Indicators : at least 2 research projects linked to 2 applied educational projects	Research projects around the 5 axes of research of the Institute Indicators : at least 3 research projects linked to 3 applied educational projects	Research projects around the 5 axes of research of the Institute Indicators : at least 3 research projects linked to 3 applied educational projects

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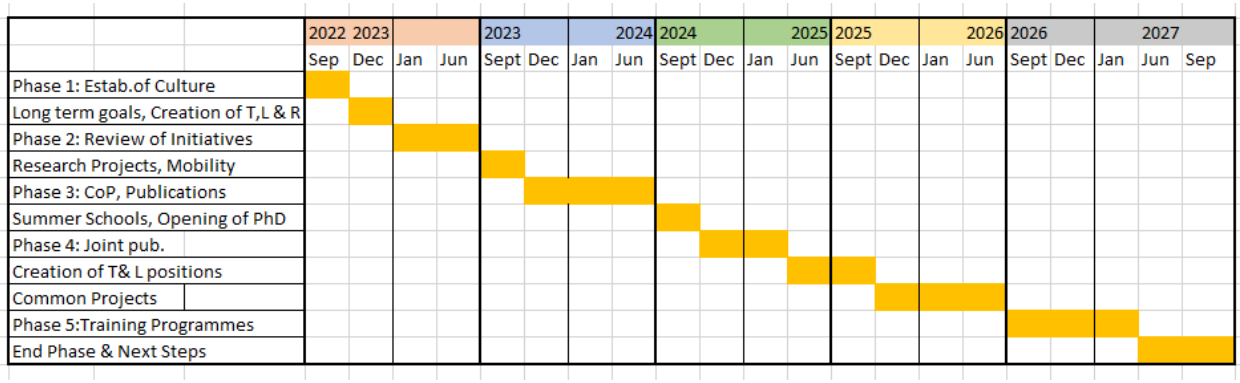
Indicators (KPIs)					
Publications	At least 2 joint publications linked to research projects Indicators :	At least 3 joint publications linked to research projects Indicators :	At least 4 joint publications linked to research projects Indicators :	At least 5 joint publications linked to research projects Indicators :	At least 6 joint publications linked to research projects Indicators :
Indicators (KPIs)					
Dissemination	Summer School Temporary website & community of practices Indicators :	Summer School Creation of a European conference in learning and teaching practice Website & community of practices Indicators :	Summer School European conference in learning and teaching practice Website & community of practices Indicators	Summer School European conference in learning and teaching practice Website & community of practices Indicators :	Summer School European conference in learning and teaching practice Website & community of practices Indicators :
Indicators (KPIs)					
Strategy post-graduate students	Inclusion of current PhD and post-doctoral students in research projects Indicators :	Inclusion of current PhD and post-doctoral students in research projects Indicators :	Opening of PhD and post-doctoral positions Indicators :	Opening of PhD and post-doctoral positions Indicators :	Opening of PhD and post-doctoral positions Indicators :
Indicators (KPIs)					

Recruitment & Careeer support for teachers and researchers	Work on the creation of teaching and research positions within the Institute Work on the conditions of association to the Institute for researchers Opportunities for mobility Training programs Network & community of practices	Creation of teaching and research positions within the Institute (permanent and associated) Recognition of the statutes of permanent and associated researchers Opportunities for mobility Training programs Network & community of practices	Creation of teaching and research positions within the Institute (permanent and associated) Opportunities for mobility Training programs Network & community of practices	Creation of teaching and research positions within the Institute (permanent and associated) Opportunities for mobility Training programs Network & community of practices	Creation of teaching and research positions within the Institute (permanent and associated) Opportunities for mobility Training programs Network & community of practices
Indicators (KPIs)					
Student-centered activities	Projects dedicated to the improvement of student skills				
Indicators (KPIs)					
Technology transfer	Association with external actors Indicators :	Common projects with external actors Dissemination to external actors	Common projects with external actors Dissemination to external actors	Common projects with external actors Dissemination to external actors	Common projects with external actors Dissemination to external actors
Indicators (KPIs)					

7.2. Longitudinal study



Step 01 – Foundation of the Institute – Cultural Values

Our proposed research centre first activity will focus on the articulation and development of a ground-breaking educational research institute the creation of the working environment, identification of values, through a focused approach on people first. We aim to create a high-quality working environment supported by technological and digital research as critical elements that would help manage, organise, structure, coordinate, visualise and communicate the centre's activities. The outlined research projects will be supported by continuous training to enable the transfer of knowledge and the application of innovative ideas that contribute to nurturing a high-quality teaching, learning and research working environment. The output generated by different research teams will be communicated across the Alliance to foster a process of constructive feedback that helps to develop an association across all the universities and with an overarching impact on every faculty.

We emphasise the importance of not separating research activities from the learning and teaching process as they are critical to ensuring the reliability and stability of our work. To accomplish our goals, we will identify our centre core values that will be guided by a focused approach on people and for people to cultivate and foster talent. We will create our research institution working ethos embedded in TEN guiding values as follows:

1. People
2. Teamwork – Quality – Professionalism
3. Collaboration, Participation, and Knowledge Sharing

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4. Constructive and Critical Thinking, Creativity, Innovation, Constructive Feedback
5. Value of Experience and Innovation
6. Collaboration and Networks
7. Strategic Framework and Funding Planning
8. Leadership, culture, and values
9. Institutional, departmental, and unit practices
10. Promotion and Communication Strategies

The research centre will aim to create a **working environment where all members' contributions are valued and with an organic rather than hierarchical organisation** - **to ensure that everyone is research active - and promote a leadership culture at every level**. The team's needs and abilities will be identified to create diverse working groups that embrace a culture of research generation, research-informed and research-innovation practice. All members of the research centre will contribute to developing a vibrant, supportive, forward-looking, diverse, multicultural, multilingual, and multi-ethnic working environment that embraces constructive criticism as part of their development and communication strategies.

Core Activities associated with Research Direction 01 Education for Sustainable Development are as follows:

a) The attraction of high-quality researchers
b) Recruitment of Doctoral Students – Sustainability Principles: Self-funded students combined with scholarships and partnerships with the industry
c) Co-Creation of Research Events with collaboration from governments, international organisations, industry, etc.
d) Annual Summer School and Annual Research Event/Festival framed on transdisciplinary research to advance educational models
e) Open Access Research Publications
f) Authoring Books, Handbooks, etc.
g) Seminars, Workshops, Training
h) Partnerships with relevant organisations to attract funding
i) Focus on industry collaborations to attract research funding
j) Training courses focused on industry and relevant stakeholders

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Step 02 – Implementation

Once the cultural values are established it will lead to our achieving the next stage. The next steps of be these 11 research projects will:

- Offer a series of tailor-made learning trajectories
- Develop critical thinking, authentic tasks and preparedness for professions, engagement with industry and transferable knowledge in staff and students.
- Embed the EUt+ as a storehouse for knowledge and talent and relevant skills
- Develop competent, creative, ethical, ecologically sensitive and socially responsible educators who are skilled in addressing complex educational issues
- Develop critical thinking, teamwork, communication and reflective skills
- Future proof the participants with relevant skills for engaging with existing and emerging technologies
- Form links and best practice to build a community of knowledge to ensure life-long learning
- Build on the links with our International partners
- The creation of living labs (staff, students, researchers to cooperate with other key stakeholders to solve societal challenges and encourages application of knowledge to real-world context (EC, 18.01.2022)
- Support in co-design the curricula (EC,2022)
- Promote synergies/achieve parity of esteem between education and research

8.I nstitutional Sustainability Plan

Stage 1 Output Measures and Indicators – Year One

It is proposed to gather feedback from students and staff on the project within the Universities disseminate it afterwards with a view to both producing a toolkit that can be critically evaluated.

The expert feedback and the findings will be analysed by the research team and brought to the Advisory Board for discussion, synthesis and development of the next iteration of the learning model and to monitor the performance and progression of the project. In the final stage of the project, the feedback and findings will be used to define the toolkit methodology and to prepare a policy note to contribute to emerging policy on transdisciplinarity in Education.

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Stage 2 Growing Funding and Sustainability – Year Two to Four

2a Collaboration on Projects

The funding support necessary for the establishment will initially be derived from the seed funding and will grow organically from initial collaboration projects. These will form the starting point for scaling up the projects from initially involving staff and students in Collaborative Online Inter disciplinary Learning (COILs).

2b Collaboration with International Partners

Our collaboration on learning will initially involve existing University partners that we collaborate with in the international context before expanding further. At present our partners include:

1. Collaborative partnership 1 – United Nation Institute for Training and research (UNITAR);
   Collaborative partnership 2 – Universität Oberta de Catalunya (UOC)
   Collaborative partnership 3 – University of Limerick
   Collaborative partnership 4 – University of Pau and Pays de l'Adour (UPPA)
2. Collaborative partnership 1 - Purdue University

   Collaborative Partnership 2 - Stanford

2c Shared Modules to Shared Degress

The initial sharing of projects will lead to shared modules to eventually to shared degrees. These will be scaled up over the time with reflection at each stage to ensure that best practice is shared and that the standards are improved.

2d Shared Resources

The sharing of modules and establishment of joint awards will lead to a sharing of resources and elimination of duplication.

The funding necessary to support these projects will be costed in advance of proceeding with each stage. Funding will come from internal resources within each University, external funding obtained from research grants, cost savings from shared resources and income generated from fees.

Stage 3 Outcomes – Year Five

By the end of five years this project will:

- Establish a Research school for postgraduate master-by-research and doctoral student with training and secondment provision
- Provide CPDs to support the staff to develop and manage their career path

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- Ensure a better quality of staff support around smart tools.
- Lead to better student results, increased student's motivation and satisfaction.
- Spread new pedagogic insights
- Structure the access and exchange of knowledge between the participants
- Provide solutions for continuity of the initiative
- Specific guidance material
- Handbooks
- Concrete Packages/deliverables based on evidence
- Future-proof education Toolkits (peer learning scenarios and identification on good practice) (EC, 2022)
- Toolkits for boosting resilience of the alliance

9. Project Sustainability – Beyond Five Years

Through this project, the universities have an opportunity to build a European wide network, one that not only includes students, staff, but also a range of expert consultants, different disciplines and community partners. This new **'smart education'** method should offer the opportunity to test, in an in person and online formats and co-create knowledge about our shared goals.

There is opportunity for all the project work to be calibrated to include European learning and teaching strategies while at its core, aligning with the UN sustainable goals.

- According to the European Commission Report (2022, p. 7) "*The EU's higher education sector shows signs of significant underfunding, especially in the light of the increase of numbers of students and growing responsibilities of universities.*" We acknowledge this reality and the need to develop an ambitious and defined funding strategy for our Institute that is sustainable, feasible and in alignment with our Institute activities and the current financial pressures of Universities funding models at global level. In order to accomplish our goals, we recognise the need for a mixed/hybrid funding model that integrates public and private funding supported by a diverse and active portfolio that ensures securing required funds and the development of a sustainable pathways to access European, National and in particular engagement with the development of investment from the private sector.

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9.1.Output Measures and Indicators

It is proposed to gather feedback from students and staff on the project within the Universities disseminate it afterwards with a view to both producing a toolkit that can be critically evaluated.

The expert feedback and the findings will be analysed by the research team and brought to the Advisory Board for discussion, synthesis and development of the next iteration of the learning model and to monitor the performance and progression of the project. In the final stage of the project, the feedback and findings will be used to define the toolkit methodology and to prepare a policy note to contribute to emerging policy on transdisciplinary in Education by createing living labs.

9.2.Project Sustainability

Through this project, the universities have an opportunity to build a European wide network, one that not only includes students, staff, but also a range of expert consultants, different disciplines and community partners. This new method should offer the opportunity to experiment, in an in person and online formats and co-create knowledge about our shared goals.

There is opportunity for all the project work to be calibrated to include European learning and teaching strategies while at the same time, aligning with the UN sustainable goals.

9.3.Outcomes

- Establish a Research School for postgraduate master-by- research and doctoral student with training and secondment provision.
- Support the mobility of staff and students.
- Improve the teaching, learning and research within our Universities.
- Identify new solutions with a focus of transformative pedagogy using mixed methods.
- Undertake a longitudinal study to measure the effectiveness of the new methods. The study will encompass the structure, the effectiveness of the change and develop metrics to assess the impact of the new methods.

9.4.Milestones – TESST Research Institute Funding Model

Hybrid Funding Model: We aim to develop an organic model for growth and development based on a hybrid funding strategy that integrates *teaching, learning and research elements.* Our objective is

to foster *innovative teaching, learning and research approaches and create synergies across disciplines that support the development of a disruptive learning space without limits*. The learning environment will be defined by a *circular pedagogy*[1] that informs the Institute's activities and leads to creative, innovative and critical thinking that drives an actionable process of change across the EUt+. We will engage in an active funding strategy supported by its strategic focus on *Education, Research, Innovation and Service to Society* through the lenses of transdisciplinary research for sustainable Education.

As part of our funding model, we face significant challenges. The current funding context for universities is very limited and characterised by the differentiation between **teaching funding and research funding only** (European Define Project, 2015). In alignment with our Institute's vision, we aim to develop a model that integrates our Institute's five Axis of Education. Our strategic vision revolves around teaching, learning and research by developing an active strategy to attract resources through the combination of a different range of activities in partnership with industry, the public sector and other relevant stakeholders. Our funding strategy will be guided by **two critical teams** that will specialise in the development of networks with private and public organisations with the core objective of attracting funds. The teams' core functions will be identifying funding calls, preparing competitive applications, and developing a broad and mixed network that leads towards contract research and consultancy opportunities so that we gain financial autonomy. Over the next five years, we will work towards a funding model that enables the Institute to have a diverse pool of resources that ensures financial viability and sustainability. The funding model aligns with our Institute's Vision as our prime interest is to contribute to the advancement of learning by providing and nurturing a close association between research and teaching. We will align our work with high-quality international standards so that our activities become a repository of knowledge and expertise supported by scientific evidence that is pivotal to the Institute's ambition to become a beacon of educational change across the Alliance and within Europe.

Table 01 below outlines our Research Institute's actionable funding plan to be implemented over the next five years and will follow a gradual and organic growth process. Figure 01 provides details of our gradual approach to achieve financial sustainability.

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10.Budget Plan

The budget plan's main objective is to gradually transition towards a hybrid funding model that combines public and private resources to reach a 50:50 ratio within approximately one decade of the institute's functioning. Table 01 below provides insights into initial activities that have been identified and will need to be actioned progressively as the institute begins to function.

Table 01 : Target Public Resources(50%) + Private Resources (50%) – 5 Year Funding Projection Ratio 80:20

Activities – 5-Year Projection
Public Resources – Target 50% over a decade
Team 01 – Specialised in the development and targeting of Public Fund Calls and Attraction of Public Funds
Erasmus+, Horizon Europe, Digital Europe, the Recovery and Resilience Facility, the funds under shared management or InvestEU, National Calls, Tenders, etc.).
Development of Training Programmes focused on Industry – Identification of Skills Mismatches (Re-skilling and upskilling programmes) – focused on Industry – National Calls
International + National Scholarships (Students focused)
Transdisciplinary Educational Programme (joint degrees): Undergraduate up to Doctoral Studies that integrate digital and green skills (mixed? – public and private funds – students fees)
Attraction of PostDoctoral Researchers (Marie Curie fellowships, etc.)
Focused Training (Smart Educator) across the Alliance and targetting primary and secondary education (teachers). **Creating Europe's Smart Educators**
Private Resources Target 50% over a decade
Team 02 Specialised in the development of Partnerships with the Private Sector and Relevant Stakeholders
Target Self-Funded MPhil + PhD students (EU and Non-EU tuitions and fees – target Non-EU students???)
Entrepreneurial Education – focused on SMEs (tailor-made training programmes for industry development)
Education for Sustainable Development – focused on businesses
Summer Schools + Research Events targetting early career researchers (fees)
Consultancy Projects in Partnership with Industry
Corporate Funding (Executive Training)
Community OutReach (Targeted funding)

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Field Specific Funding (Transdisciplinarity + Pedagogy + EDI + Environment+?)
Former Students' Donations and Philanthropists' Collaborations
Scientific Reports and Publications (Industry Contracts – Consultancy Activities)
Partnerships with Incubators, Technological Companies, Talent Fairs, etc. (Focused Training)
Develop **STEM**-oriented pedagogy/programmes (Training)
Online Training Platform in Collaboration with Industry and Government Bodies
Green Education and Innovator Living Lab (Testing Technologies for Academic and Industry Learning – Industry Partnership)
Open Pedagogy Incubator – Circular Pedagogy (Technology & Innovation – to Work with Industry)
The Alliance (EUt+) Educational Festival – Smart Education for Sustainable Development (Sponsorships, etc.)
Education for Actioning the UN 2030 SDGs (industry focused programme) – Development of Actionable Training for Industry
Short learning courses : microcredits, microcrendentials, CPDs and professional development (Digital Skills and Green Transition) – Target Industry, Goverments, Communities, Schools, etc. – Partnership with Technological Corporations for delivery?
MOOC transdisciplinary pedagogical training? – marketing purposes of Institute activities???
Hybrid Funding 50:50 ratio
Team 01 + Team 02 work together to identify Funding Opportunities that combine Public + Private Funds to create funding synergies
Secure Contract Research & Identifify Consultancy Opportunities
Training courses focused on stakeholders' needs (government + industry funding?)
Partner with EUt+ Students to identify activities that lead to funding (Community Engagement, Incubators, Students Festivals, etc. ?

[1] http://cyclecc.eu/spanish/wp-content/uploads/sites/4/2019/06/Result-1.-CYCLE_final.pdf

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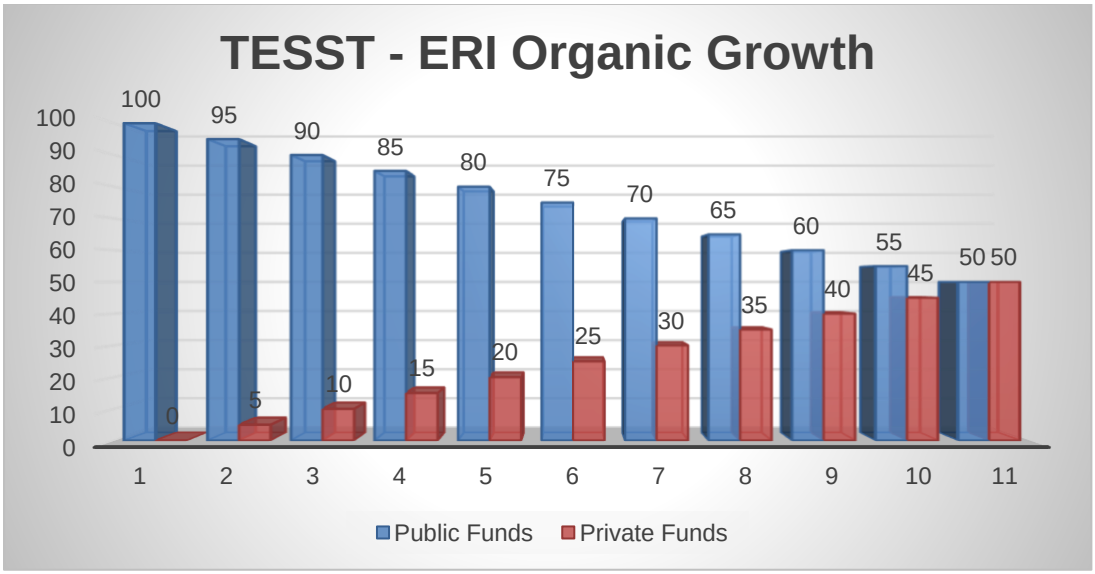
Figure 01: TESST 11 year Funding Projection



The Research Institute's funding model will converge towards a 50:50 Hybrid funding model over approximately ten years from its foundation. The financial plan is based on a cohesive strategy that simultaneously targets an annual arithmetic growth rate of 5 per cent (private funding grown and public funding decay), which in time will help to reduce dependency on public funds by actively targeting the attraction of private funding. The financial plan is supported by an organic increase of private funding to reach a balanced approach that ensures that the Institute approaches a sustainable level of financial autonomy. The core elements of the financial plan are to work on the initial foundations of its self-funded model by enabling gradual growth to ensure continuous development and the consolidation of a financial viable self-funding structure.

The Institute founder's team has made significant progress to date, as it has managed to secure ERASMUS+ funds for its first project. In addition, a strategic collaborative partnership with UNITAR is under development to target private funding. Below we offer an overview of the work done and the Institute's projection to articulate its financial autonomy guided by its aspiration of achieving a 50:50 funding model structure.

Table 02: Budget plan - 24 months projection

Project*	**Date**	**Secured Funds €**	**Targeted Funds €**
ERASMUS+ Project 01	July 2022	250,000	-
ERASMUS+ Project 02	2023 Call	-	300,000
Self-Funded Non-EU PhD Students (5) – potential fees €10,000 per student annual (4 years)	Require mechanism to be implemented	-	200,000
Educational Offer with UNITAR	Require framework for implementation	-	450,000
Executive Educational Offer	Require framework for implementation	-	125,000
Total Secured Funds		250,000	-
Total Projected Funds			1,075,000

*Projects under development

Total Projected Funds: €1,325,000

Total Projected Funds: €1,325,000 (Generated Funds Through Hybrid Funding Model) within 24 months, growth in self-funding activities represent 13.25% growth. Based on our arithmetic growth projections will overperform our predictions of growing 5% on annual basis by 3.25% within the first 24 months of work.

Work in progress is as follows:

a) Secured Funds ERASMUS+ Project – Amount: €250,000 – TESST founder members succeeded in securing this project entitled: Transformative Digital Pedagogies for Higher Education (TDP4HE) (Public Funds)

b) Work in progress Second ERASMUS+ Project. The institute founder team is working on its second application targeting – Amount: €300,000 (Public Funds)

c) Self-funded PhD Students Potential – 5 students (Potential fees: €10,000) – Amount: 50,000 per year for four years – Amount: €200,000. This element would benefit from Public Funds support enabled by the Universities and students that secure scholarships to initiate the Hybrid Funding Model. Right now, the Institute could recruit 5 self-funded PhD students to work on issues related to ESD. Capacity could be increased with the Universities support (Hybrid Funding)

d) Development of Educational Offer in collaboration with UNITAR – Area: Education for Sustainable Development. Programme Structure: Microcredits, CPDs, PGCertificate, PG Diploma, Masters and Doctoral Education. Market: EUt+ academics, Global Market. (Hybrid Funding)

e) TESST will provide the educational offer for the Alliance and in addition will target the international educator community by providing an offer focused on primary, secondary and tertiary Education. Academics at EUt+ will be required to complete a PG Diploma in Education (TU Dublin academics are required to complete PG Certificate/PG Diploma to be able to secure their tenure. The programme will be developed in collaboration with UNITAR to ensure alignment with the UN 2030 agenda and UNESCO educational guidelines. For HEIs TESST will develop an innovative programme that integrates teachers and researchers to ensure alignment with the Research Institute philosophy of its novel "Circular Pedagogy". It is expected that the programme will attract 30 students annually with a potential fee of €15,000, generating €450,000 annually. (Hybrid Funding)

f) Executive Programme in Education– EdD & PhD, Market: Universities Leadership Teams (EUt+ Alliance and Global Market – Innovate. The programme is expected to attract 10 students with a potential fee of €12,500, generating €125,000 annually. (Private Funding)

11.Barriers to materialise Budget Projections for the next 24 months

a) Initial funding support enable progressing with the outlined plan

b) Support to enable the creation of the Institutes critical working teams.

c) Founder members face significant pressures to be able to work as activities are fully dependent on the members' free time and personal dedication, significantly affecting their ability to progress and interfering with family and vacation time.

d) Funds are being lost due to the lack of appropriate working framework. For example, the institute could start recruiting Non-EU self-funded PhD students to work in Research Direction 01 immediately.

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e) Need to articulate framework to work with TU Dublin – UNITAR. Critical elements of the Educational offer in collaboration with UNITAR could be actioned within 12 to 18 months.

f) Research Initial Funding to enable recruitment of PostDoctoral Researchers that will be integrated as part of the development of Team 01 & 02 to focus on developing the Institute's Financial Planning.

g) Creation of secondment positions to allow founding members to focus on the development and growth of the Institute.

h) Clarity from EUt+ Executive Team regarding Research Output through the combination of Research Funds and Publications.

i) Need to articulate EUt+ internal incentive schemes to foster motivation levels based on the Institute performance metrics.

j) Need to articulate the Institute's funding management model to ensure progress towards funding autonomy.

k) Need to define the role of pedagogy across the Alliance, provide training – resistance to change and innovation

l) Integration of Virtual Reality into education. Can be costly to run and especially set up.

m) Insufficient autonomy in matters of governance and administration of ELaRA and future TESST.

12.Process guideline for conflict management

The Institute will adhere to the EUt+ guidelines presently under development and in accordance with The European Code of Conduct for Research Integrity

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Research templates

A2.1. Research Direction 01 : Education for Sustainable Development

1. State of Art

1.1. Keywords: Education, Sustainability, Development, Competencies, Pedagogy, Circular, Transdisciplinarity, Transformation, Change, Complex Adaptive Systems, Resilience, Smart-Educator, Smart Economy, Knowledge Economy, Peace, Justice, Inclusion.

1.2 Project Background

This research project aims to provide an educational framework for EUt+ that aligns with the UNESCO recommendations regarding the need for educational systems that embrace sustainable development. UNESCO defined Sustainability Education (SE), also known as Education for Sustainable Development (ESD) as,

"education that intends to empower students to make informed decisions and responsible actions to ensure economic feasibility, environmental integrity, and just societies while respecting cultural diversity – for the present and future generations" (UNESCO, 2017).

However, in line with Moore (2005), the interdisciplinary nature of higher sustainability education is characterised by transmissive approaches where the teacher remains in firm control of knowledge. As a result, we are failing to equip students with the required skills to manage the complexity of current socio-economic and environmental problems and the challenges associated with a broader range of sustainability issues (UNESCO, 2017; Gale et al., 2015; Sterling, 2010; UNESCO-UNEP, 1990). We must reflect, think and rethink our dominant educational culture and its impact on existing/prevailing learning models. We are not arguing that we need to reinvent the wheel, but undoubtedly careful consideration of what we are doing and what we can do to improve our practice is necessary. We call for a review of existing research, learning and teaching paradigms, techniques, rules, methods and approaches to help us address current and future challenges. The European University of Technology (EUt+) needs a comprehensive review of its existent educational modules so that we are able to understand are strengths, weaknesess, opportunities and threads. Therefore, there is an imperative need for different ways of thinking, learning and doing that are more critical, innovative and reflective. We are proposing the development of the **"Circular Pedagogy"** that is an innovative and novel concept that will develop in parallel with our Institute and that well act as a disruptive element of how we understand the role of the teacher, the student and the researcher.

Transdisciplinary Education emerges as a core learning paradigm that will guide our work as we pursue a more holistic approach. Our initial reflections have driven us to think about Critical Theories and Complexity Theory as our leading framework to drive change. We aim to reimagine Education and develop a new vision for the EUt+ educational system and models as we seek to drive change by embracing transformative learning and critical and disruptive thinking paradigms. The three outlined

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paradigms might emerge as essential to enable us to drive change that leads to actions and positive impact. HEIs are defined as Complex Adaptive Systems (CAS) that require innovative management systems guided by new ways of thinking and doing to enable and nurture transformative learning environments (Priyadarshiny, and Abhilash, 2022; Ueland, Hinds and Floyd, 2021; Martin, 2019). Mezirow, one of the most significant thought leaders in the field of transformative learning, defined it as,

"a process by which we transform our taken-for-granted frames of reference…to make them more inclusive, discriminating, open, emotionally capable of change, and reflective so that they may generate beliefs and options that will prove more true or justified to guide action" (Mezirow, 2000, p. 7–8).

Sheninger (2021) reflects on the importance of disruptive thinking in our classrooms and its relevance in preparing learners for their future,

"*If we are to develop students who think disruptively, we must examine and reflect on our current teaching and learning practices. We, too, must become disruptive thinkers, which I define as: replacing conventional ideas with innovative solutions to authentic problems."*

This research project aligns with Mezirow(2000) and Sheninger (2021) ideas as we seek to contribute to the development of disruptive learning environments that transform education and enable disruptive thinking that fosters innovation and transformation.

1. Reasons/ arguments/ motivation for doing the project

This project is guided by the need to rethink and reassess educational models and pedagogies. The proposed research will offer a disruptive and transformative learning, teaching and research framework to conceptualise the Alliance vision and its contribution to the Educational framework by integrating Critical Theory and Complex Adaptive Systems to enable the development of Education for Sustainable Development in Europe.

2.1 Guiding Theoretical and Conceptual Framework

This research project will start with Mezirow and Sheninger reflections to help us define the Institute's purpose, which also requires a theoretical and conceptual framework that guides our research endeavours. We consider that Critical Theory and its extensions can play a significant role as part of our research and reflective process. Their social constructs seek to analyse, examine and critically engage with understanding and identifying underlying assumptions in social life to help people become more aware of how the world operates. Within the context of this project, we will be guided by the precepts associated with critical theories in parallel to new discourses in the educational context and how individuals learning experiences might be affected by existing educational models. We seek to interact with a wide range of critical theories that explore our society's socio-economic and environmental problems as they are fundamental to driving meaningful

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change. Critical Theories will inform our research endeavours because they are considered social theories that act as a bridge between ethics, political philosophy and the philosophy of history. The theories have evolved and extended to other disciplines such as feminism, race and economic theories, to name just a few. An example of relevant theories in this domain that have expanded from the original Frankfurt School of thought, also known as the Institute for Social Research, explores issues related to gender, race, ethnicity and economics (Corradetti, 2013; 2009). In particular, we identify Theories of Gender, Theories of Race, Economic theories like Globalisation, and Theories for Social Justice.

But why are critical theories important in the context of educational models ? As an initial example, we can consider that theories of gender focus on understanding power balance dynamics between men and women that quite frequently lead to situations of conflict and inequalities. Our study will offer further insights that integrate multi-gender or multiple gender variants to ensure that we are attuned to our society's needs and all-encompassing change. Research studies have shown that there is no fixed number of gender identities, and numerous gender identities can remain the same or move and change through time, creating a myriad of problems. For instance, educational institutions can easily engage in micro-aggressions that create hostile environments towards individuals that do not fit the category of being a man or a woman. Furthermore, the issue of ethnicity emerges as another form of aggression, confrontation, discrimination and exclusion that racial problems can compound. Critical theory in Horkheimer's (1972) viewpoint, means that the theory must explain what is wrong with the current social reality, identify the people and actors that can change it, and provide both achievable, practical objectives for social transformation and enable ways and mechanisms of evaluating, analysing and criticising those objectives with the aim of promoting significant change. We argue that Horkheimer's insights are critical to helping us understand the reality of our educational systems, models and modes for learning, the student/teacher/researcher relationship, classroom dynamics, the role of research and the researcher within the educational context. Our research will align with the need for an explanatory research context, with practical elements and a normative dimension that ensures positive change. Therefore, our theoretical research framework is grounded on transdisciplinary research as we aim to co-create a new educational framework that integrates different disciplines working jointly. Our vision for Education will enable us to disrupt existing approaches towards Education across EUt+ to move beyond discipline-specific domains and the need to acknowledge our teachers, students and researchers' realities, conditions, needs and demands within a very complex ecosystem.

Critical theorists argue that social sciences need to be supported by a philosophy to bring a practical approach to its methods to create impact and help advance towards a true democracy. We frame these ideas in the context of knowledge democracy, the knowledge economy and the sustainable economy as critical paradigms that might be considered to help us reimagine a new educational model for the EUt+. Furthermore, our research contribution will help to articulate our new pedagogy for learning that we coin as **TESST's Circular Pedagogy for Educational Transformation and Transdisciplinarity**. In order to achieve our goals, this project is framed around the five-axis identified in section five and more specifically guided by Axis (5), which focuses on exploring the applied nature of Education for Sustainable Development and its impact on creating more efficient learning models aligned with the concept of Global Citizenship Education (GCED). Our aim is to create awareness, and

drive change for action and impact and the need to promote the role of Education as an agent of change driven by social justice, inclusiveness, and responsibility to our societies and the environment. Our core area of interest is to demystify the rooted idea that research activity enjoys a higher status within Universities and to offer a clear connection between teaching-learning-research through a circular process of parity and esteem that will lead to a more inclusive and balanced educational model.

3. Research Design

3.1 Research Working Framework

To help us start our work, our project refers to learnings as a way to integrate critical issues such as climate change, biodiversity, disaster risk reduction, sustainable consumption, production, and business and management in a transdisciplinary context characterised by its evolving nature. Pedagogies refer to the teaching and learning designs that should be interactive and learner-centred, enabling exploratory, action-oriented, and transformative learning. Learning outcomes refers to core competencies such as critical and systemic thinking, collaborative decision-making, and responsibility for the present and future generations. Societal transformation refers to how society is organised and structured as we seek to disrupt existing practices and dominant paradigms. *We aim to transform Education in a way that brings a new dimension to the Alliance*. *We aim to make a contribution that transforms both societies and people by shaping and reshaping their patterns of thoughts, means of problem-solving and ways of life*. This project will contribute to further individual and social transformation and provide insights as we shape our Institute's research direction to ensure that a new pedagogy **« Circular Pedagogy »** will emerge from our research activities. A Circular Pedagogy that will help to question and explore the need for **« Circular and Transdisciplinary Education »** and relevance as part of the **« Circular Economy »** that lead us towards inclusive, sustainable and harmonious societies. Our Institute will empower the Alliance as a critical actor for educational change supported by cooperation, research, knowledge-sharing and innovation.

3.2 Research Activities

The research project will be structured around three major phases as follows :

a. Phase 01 will examine the impact of sustainable development across the Alliance learning models to identify to which extent each university engages with the Education for Sustainability concept and its implications for development. This initial phase will be supported by an in-depth and comprehensive analysis and assessment of the extant literature and the Alliance practices that will help us identify the main purpose of ESD and its

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reality in the context of EUt+. We will identify the core competencies associated with ESD from a disruptive educationalist perspective that informs the new ERI's pedagogical approach. Our research findings will be used for curriculum innovation, as we acknowledge the urgency of a change of educational paradigm towards authentic teaching, learning and research clearly defined by the precepts of sustainable development. The project's first phase will be developed through the lenses of critical theories to help us frame existing educational models across the Alliance and provide critical insights on the potential need for change. In addition, this phase will be supported by a mixed methodological research framework guided by action research and action learning seeking to gauge information from the University stakeholders so that we gain a deep understanding of existing challenges.

b. Phase 02 will examine to which extent *"a business modus operandi"* dominates existing educational models. We will explore how universities might transition towards operating as a corporation focused on the economic elements while neglecting the social dimension of the learning process. We recognise the need for continuously updating competencies as societal requirements press on employability issues that markedly differ from needed skills about thirty years ago. We will go even further as we witnessed a significant change in how we work and interact in a very short time period. Just two years ago, with the outbreak of the Global Health Crisis - the educational sector and the global economy faced significant challenges to ensure accessibility to students and its response to our new reality and its working dynamics. However, we argue that Education is not only about satisfying the marketplace needs nor limited to economic gains. In order to create more sustainable economic models, individuals' different roles as part of society and the economic and financial system also need to be considered if we seek to drive meaningful change and create an impact for sustainability.

c. Phase 03 seeks to be a disruptive phase of the research process. We advocate the need for transgressive learning, resistance pedagogy, and disruptive capacity-building as they can act as levers for sustainability. *New ways of thinking are needed to offer an effective response to educational systems, and to be able to bring high-quality impact, as such* ***bold change*** *is required*. During this research phase, we will focus on bringing awareness of the limitations of current educational models across the Alliance. We will offer informed recommendations supported by high-quality research, examples that enable us to provide practical examples in active collaboration with relevant stakeholders. We will move beyond the university walls to frame problems and challenges that help us move towards a more sustainable educational model. But, to enable us to make progress, we need to break our anchors to the mentality of *"business-as-usual"* practices that include issues related to individualistic cultures, growing levels of inequality, racism, poverty, exclusion, anthropocentrism, exploitation, marginalisation and gender discrimination, among many more. Furthermore, we need to break the idea of separating teaching-learning and research activities, as their integration as part of **the Alliance New Educational Model (ANEM)** is critical to bringing change.

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3.3 Research Project Core Elements

At the global level, Education has experienced a dramatic call for change. The educational sector is in dare need of: 'integrative and holistic approaches,' 'fundamental and systemic change,' 'empowering, action-oriented and reflexive forms of learning,' 'boundary-crossing between the worlds of education, research, governance, business and civic society,' and 'deep engagement with sustainability-related 'wicked' issues' around, climate, health, justice, equity, biodiversity, and so on, many of which are captured by the SDGs (Wals, 2021).

3.3.1 Scope

This research projects seeks to offer an in-depth analysis of EUt+ educational models and their alignment with ESD. The project will support the development of a new innovative pedagogy and propose a new educational framework for the Alliance.

3.3.2 Objectives

The core objectives associated witht this project are summarised as follows,

a. Development of the Alliance pedagogy

b. Provide a comprehensive working framework to integrate sustainability across universities

c. Drive educational transformation

d. Inform curriculum innovation

e. Provide a clear framework between the teaching-learning-research nexus

d. Create the Alliance New Educational Model (ANEM)

3.3.3 Participants

Teachers, Learners, Researchers, Industry, Governments and Stakeholders

3.3.4 Methodology

This project will be supported by an Action Research Methodology under the construct of EUt+ and guided by a Mixed Methodological Framework and Mixed Methods that enable a triangulation process.

3.3.5 Instruments

The project will require the use of a wide range of instruments that ensure that required data is gathered and analysed. Identified instruments are outlined below, but the research will not limit to them and will be flexible to add innovative approaches as the research project progresses.

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a. Questionnaires
b. Observations
c. Interviews
d. Focus group discussions
e. Experiments
f. Learning Sets
g. Document Analysis
h. Data Analysis Software (SPSS, Eviews, RapidMiner, R, etc.)

3.3.6 Period of time

The proposed project proposes a comprehensive assessment of EUt+ educational models, developing a novel pedagogy, and creating the Alliance New Educational Model (ANEM). The ambitious nature of the project requires at minimum of 5 years for its completion.

3.3.7 Partners

EUt+

UNITAR

Industry

Governments

Relevant Stakeholders

4. Research Impact

This research project is a clear call for action aiming to create the **the Alliance New Educational Model (ANEM)** and seeks to offer a new vision that will help us rethink and reimagine EUt+ educational models where we aim to become agents for change. We will explore how we can drive innovation and integrate a transformative learning process that combines contemporary educational practices with innovations and new perspectives that enable a continuous evolution towards more socio-economic and environmental-conscious universities. Consequently, as part of our work, we will align with the UNESCO (2021) recommendations regarding the importance of competencies and skills to drive sustainable development. The key elements are indeed (i) skills for value creation for positive impact. These skills should focus on empowering learners to (i) make informed decisions and (ii) take responsible actions for (a) environmental integrity, (b)

economic viability, and (c) a just society for present and future generations while (d) respecting cultural diversity within communities.

Finally, this research project will inform our Institute's pedagogy framed on Education for Sustainable Development, led by responsible learners, active researchers and conscious teachers by focusing on five core elements:

- Research, teaching and learning nexus
- Learning content
- Pedagogy and learning environments
- Learning outcomes and
- Societal transformation

Our research aims to challenge and disrupt the concepts of learning, pedagogy, learning outcomes and societal transformations to align them with our Institute's vision, mission and cultural values. To help us start our work, our project refers to learnings as a way to integrate critical issues such as climate change, biodiversity, disaster risk reduction, sustainable consumption, production, and business and management in a transdisciplinary context characterised by its evolving nature. Pedagogies refer to the teaching and learning designs that should be interactive and learner-centred, enabling exploratory, action-oriented, and transformative learning. Learning outcomes refers to core competencies such as critical and systemic thinking, collaborative decision-making, and responsibility for the present and future generations. Societal transformation refers to how society is organised and structured as we seek to disrupt existing practices and dominant paradigms. We *aim to transform Education in a way that brings a new dimension to the Alliance*. *We aim to make a contribution that transforms both societies and people by shaping and reshaping their patterns of thoughts, means of problem-solving and ways of life*. In this way, TESST ERI will contribute to further individual and social transformation and provide insights as we shape our Institute's research direction to ensure that a new pedagogy will emerge from our research activities. Our Institute will empower the Alliance as a critical actor for educational change supported by cooperation, research, knowledge-sharing, smart development, social justice and innovation.

Future directions – Research Direction 01

This project represents a clear commitment to improving European Education. The project will offer a defined contribution to the creation of the Alliance New Educational Model (ANEM) and founded on a new learning paradigm supported by the Institute's novel Circular Pedagogy. Future directions will seek to ensure that European Universities educational models are attuned with our global society

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reality and that we contribute to the education of global citizens that advocate sustainable development.

Fundings and resources

This project requires EUt+ support to be initiated. Targeted Funds: €1,500,000

Required Resources are identified as follows,

3. 3 senior postdoctoral researchers
4. UNITAR expertise
5. 5 PhD students
6. Equipment
7. Mobility
8. Reports, handbook, publications
9. Seminars and Workshops

Diagram

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A.2.2. Universal Design for Learning for All in the context of Inclusivness, equity and belonging in education

1. State of Art

Strategic priority 1: Improving quality, equity, inclusion and success for all in education and training

(Resolution on a strategic framework for European cooperation in education and training towards the European Education Area and beyond (2021-2030)

(Brussels, 19 February 2021)

1.1. Keywords:

universal design for learning, Inclussivnes, equity, belonging, sustainable education, smart education,

2. Arguments

In many countries, inclusive education is still thought of as an approach to serving children with disabilities within general education settings. However, internationally it is increasingly seen more broadly as a principle that supports and welcomes diversity among all learners. This means that the aim is to eliminate social exclusion that is a consequence of attitudes and responses to diversity in race, social class, ethnicity, religion, gender, sexual orientation, migrant status and ability. As such,

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it starts from the belief that education is a basic human right and the foundation for a more just society.

In an education system based on the principles of inclusion and equity, all students are assessed on an ongoing basis in relation to their progress through the curriculum. This allows teachers to respond to a wide range of individual learners, bearing in mind that each learner is unique. In particular, there have to be sensitivities regarding the cultural, ethnic, and linguistic backgrounds of students. At the same time, it is essential to create safe and inclusive learning environments which are free of violence and discrimination of any kind.

This means that teachers and other professionals must be well informed about their students' characteristics, interests and achievements, while also assessing broader qualities, such as their capacity for cooperation. However, the ability to identify each student's level of performance is not enough. Teachers in inclusive systems need to gauge the effectiveness of their teaching for all of their students and should know what they need to do to enable each student to contribute and learn as well as possible.

In order to follow the SDG 4, this research direction will be organized according to the "living lab" vision (EC, 2022) and we target a physical space located at the Technical University of Cluj-Napoca, North Center Baia Mare. This research direction will be oriented to examine structure and agency through an evidence based best practice of contextual barriers to participation and progress of learners. In other words, this direction will identify and try to remove the obstacles to more compatible higher education systems applying to the EUt+ initiative (EC, 2022). Universal design for learning (UDL) Curriculum design, teaching and assessment methods are critically explored to support inclusion and equality and the sense of belonging in education. At the same time the direction will throw the lenses of inclusiveness, equity and belonging this research direction will promote innovative and transformative approaches for learning and teaching at all levels: Bachelors, Master and Doctoral levels.

3. Design of research

3.1. Aim: Create a ”living lab” focus evidence based practice on Inclusivness, equity and belonging in education technology, alongside with

3.2. Objectives

3.2.1. Establish clear definitions of what is meant by inclusion and equity in education

3.2.2. Identify contextual barriers to the participation and progress of learners

3.2.3. Support for teacher in promoting inclusion, equity and belonging in education

3.2.4. Support in designing the curriculum and assessment procedures with all learners in mind (UDL)

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3.3. Participants Representants from each campus and relevant stakeholders

3.4. Methodology

Orientation : Pragmatic & transformative
Research design –

- Complex mixed methods designs have multiple research phases, are conducted over several years (5 years plan for future institute), have substantial funding for the investigation, and include mixed methods core designs within different phases of the research (Natasi and Hitchcock, 2016).
- Transformative mixt methods

3.5. Instruments

Quantitative and qualitative tools

3.6. Period of time: 2023-2025

3.7. Partners

– EUt+ (representant of the other research direction)

- Relevant Stakeholders

4. Outputs and Outcomes

- *Smart profiles*
- Handbook
- Seminars and Workshops

5. Impact of the project

Level I, II, III

6. Future directions

- Realize the first extend draft
- Obtain fundings
- Implement the project
- Transfer the results

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- Identify new directions

7. **Fundings and resouses**

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A2.3. Digitally enabled Development of Key Competence for a Sustainable Society: The Personal, Social and Learning to Learn Competence. European Case Studies

1. State of Art

Currently, the OECD is developing the Education 2030 project, which further aims to create an educational framework oriented towards the competence-based education model (OECD, 2020). With the European Recommendation on Key Competences (2018), the Personal, Social and Learning to Learn Competence (PSL2LC) has been acknowledged as one of the eight Key Competences for Lifelong Learning. LifeComp (Sala et al., 2020) is a conceptual and non-prescriptive framework that establishes a common understanding of PSL2LC, can be acquired through formal, non-formal and informal education, and can help individuals to thrive in the 21st Century.

1.1. Keywords: personal, social, learning to learn competence; sustainable development; transformative key competence; transversal competences.

2. Reasons/ arguments/ motivation for doing the project

This project offers the opportunity to problematize and implement the interaction between the competency-based education model, the most used nowadays, and education for sustainable development, which is a systemic, integrative, creative vision of dialogue and consensus, by developing PSL2LC that will help the individual to adapt throughout life, by valorizing digital technologies, real life contexts, and student experiences, by connecting disciplines in a multi/ pluridisciplinary perspective through transdisciplinary activities, by building bridges in terms of value and action between actors, institutions, between different perspectives, between tradition and modernity.

3. Design of research

A mixed methods case study design is a type of mixed methods study in which the quantitative and qualitative data collection, results, and integration are used to provide in-depth evidence for a case(s) or develop cases for comparative analysis.

3.1. Scope

The goal of the project is to empower university students with personal, social and learning to learn transformative key competence through digital technologies towards a sustainable society.

3.2. Objectives

1. to create a scientific basis for identifying and assessing students' PSL2LC and their digital skills at each level of study;

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2. to guide university teachers and students in the development of PSL2LC (reskilling and upskilling), according to their specialized fields and to promote active learning;
3. to advise university teachers and students on the development of PSL2LC and the design of innovative teaching-learning practices through the use of technology together with strengthening cooperation with other stakeholders;
4. to exchange good innovative educational practices in European Higher Education.

3.3. Participants

The results of the project are primarily relevant for university teachers and students, but also for higher education institutions and other stakeholders (associations for higher education, companies or other workplaces).

3.4. Methodology

The research methodology is based on a methodological system which will include: surveys, interviews, experiment, case study, study of activity products, techniques and tools for interpretation of research data etc. The methodology of the training program will include a transdisciplinary approach and will be active and participatory.

3.5. Instruments

Needs analyses, questionnaires, focus group interviews, digital tools etc. will be conducted on teachers and students from the eight partner institutions.

3.6. Period of time

The project will be carried out for 3 years.

3.7. Partners

Parteners: TUCN (Romania), and 3 other partners

Associated partners: 4 other partners

4. Outputs and Outcomes

1. A theoretical/ conceptual and empirical framework of digitally enabled development of PSL2LC;
2. A transdisciplinary training program for a sustainable society and a flexible e-guide for educators focused on teaching methodologies for different groups and different learning levels;
3. e-Toolkit with Open Educational Resources (OER) and Open Educational Practices (OEP) for the development of PSL2LC;

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4. A technical infrastructure for publishing the project results and management of the Open Community of Practice and Learning (OCPL).

5. Impact of the project

The following indicators will be used: number of students self-assessing their PSL2LC and digital skills using the project framework; number of participants, their satisfaction and feedback on the training programme; number of newly developed OER and OEP produced by the consortium; user satisfaction with the e-Toolkit; high level of engagement and interactivity of academic community with the virtual space for OER and OEP; number of active contributors to the OCPL platform; feedback regarding the functionality of the OCPL platform etc.

6. Future directions

First, the project will contribute to prepare university teachers and students for the development of PSL2LC. The partnership between companies and the universities will be strengthened to include a wider set of activities, in which the development of PSL2LC is a key component. At different levels, other institutions will be able to reuse the main deliverables generated in this project. A desired impact is the engagement and interactivity of all these institutions in the OCPL, the development and implementation of new educational and curricular policies that acknowledge the relevance of this competence as being essential not only for students' development, but also for the requirements necessary for employability.

7. Fundings and resources

financial resources, hardware and software resources, training of university teachers and students

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A2.4. Assessment system of pedagogical competencies of the academic staff (PCAS)

1. State of Art

1.1. Keywords: pedagogical competence; assesment; academic staff

2. Reasons/ arguments/ motivation for doing the project

The relevance and importance of the study has been highlighted in the European and International fundamental documents, as education at all levels, especially higher education has got multiple warnings about the approaching era of digitalization, transformation, innovation, internationalization, globalization; among these World Conference on Higher Education (2009), European Commission/EACEA/Eurydice (2017), World Bank Group Education Strategy (2020), OECD Education at a Glance (2021), UNESCO Reimagining Our Futures Together (2050). These are several among many issues and only in this millennium.

Higher education institutions play an important role in achieving the European Education Area (Conze, Meehan-van Druten, 2020) and the European Research Area (Gabriel, 2021), in synergy with the European Higher Education Area (European Commission, n.m.), paying special attention to academic staff as key element for adopting to changing conditions, achieving vital success and excellence.

Academic staff has to be equipped with different skills and competences, while there is no clear concept for pedagogical competence of academic staff. Therefore, there is a need to specify the concept of academic staff of higher education institution and then to define the updated concept of pedagogical competence of academic staff.

The core concept reflects the idea of academic staff covering the professionals in the specified field while without pedagogical background. In the context of current research, the key competences have to be listed, including the general education content for the engineering field specialists, non-teacher trained ones.

Each European country has its own individual higher education system governed by national legislation, but all are the part of the European Higher Education Area. This helps to ensure that higher education systems across Europe are compatible – that means that students, researchers and academics in Europe can collaborate and study or work with easy mobility aspect (European Commission, 2022).

As academic staff have to be equally engaged in transmitting knowledge through teaching, while producing new knowledge through research, but the roles of teaching and research have been differentiated because of the number of staff engaged in the indicated categories, but in fact they have to be linked (European Commission/EACEA/Eurydice, 2017).

In Latvian dimension, based on the following documents: Sustainable Development Strategy of Latvia until 2030, National Development Plan of Latvia for 2021-2027 and the official information for the Ministry of Education and Science Republic of Latvia, analyses the future perspectives cover the following aspects: demand for new competences and skills; the provision of education of good quality; change of paradigm in education; information and

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communication technologies – effective application in education; life-long education (Saeima of the Republic of Latvia, 2020). Same ideas are described in National Development Plan of Latvia for 2021-2027, covering the key priorities as the life-long education, digital transformation and skilled professionals, providing excellence in science (Cross-Sectoral Coordination Center, 2020).

The research will be conducted in the international, European and Latvian dimensions because a skilled and committed academic staff is a university necessity to ensure quality education and scientific excellence. This means that academic staff must be proficient in both the specific discipline and pedagogy, while pedagogical competence for assessment and evaluation is not often defined and clearly structured.

In order to clarify the concept of academic staff, one more aspect must be taken into account - educators with pedagogical education and without pedagogical education, the updated concept of this project is clarified for those who do not have pedagogical education, professionals in the field of engineering or others.

3. Design of research

3.1. Scope

In order to determine and verify the basic principles of the formation of pedagogical competence, it is necessary to clarify the basic concept of the pedagogical process, which specifies the role of each involved element, expanding the traditional triangle of students, teacher and content with the influence of the external and internal study environment.

In student-educator context the personalization of process and feedback formation are important, in student -content context there is a need of self-organization, ability to learn, the relevance to the individual needs, assistance and selection of appropriate tools and instrument; while in educator-content context the transformation of engineering field content into study content should take place together with the ability to develop a course program and organize the study process accordingly, targeted selection of methods and approaches as well as assessment of students' achievements and progress check. Nowadays, the interrelations between the core components are mapping the basic pattern for further development and improvement.

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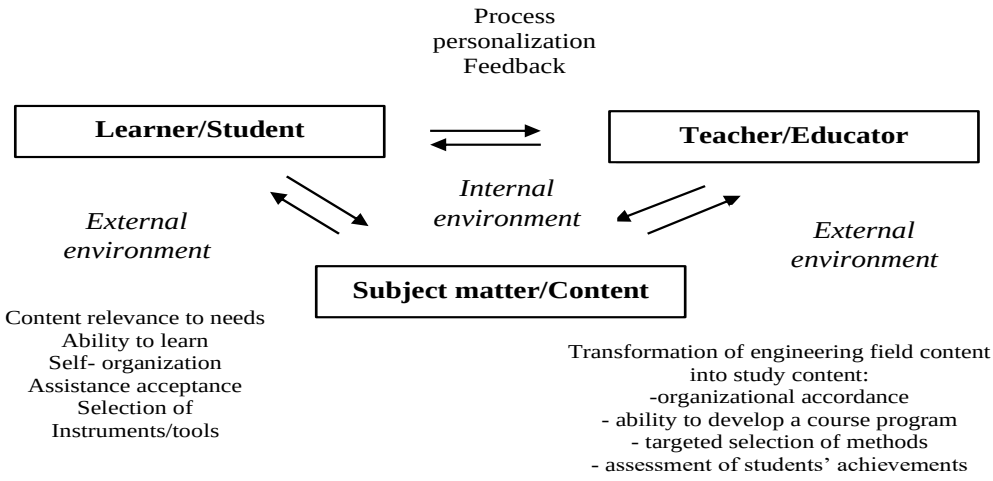

Figure 1. Key Concept of Pedagogical Process (adopted from (Žogla, 2018) O.Vindaca created)

As by analyzing the interdependence between the key components of pedagogical process, presenting the development of pedagogical science, the direction of which has been changed from external influences on the learning process to the understanding of the complex nature of learning (Žogla, 2018). Thereby, the study environment as internal as external has a fundamental influence on the pedagogical process and has to be taken into consideration for pedagogical competence formation and mapping.

Moreover, three types of interactions: student- educator; student -content and educator - content are interconnected and taken place in both directions, where the interconnections are formed taking into consideration the specified goals and tasks where an important place is for the activities of the pedagogue and the assessment of his competences.

Therefore, the basic definition of pedagogical competence consists of three main components: student learning - where the academic staff supports and promotes the achievement of the best results; progress – assessment according to defined goals and frameworks; continuous development – the ability to develop one's competences for further personal professional growth. Taking into account the definition of pedagogical competence, it is necessary to emphasize the formation of a direct connection between the learning process, achieved progress and further development (Ed. Ryegard, Apelgren, Olsson, 2010)

.

3.2. Objectives

<u>The aim of the project</u>: to **ensure the development of system for the assessment and improvement of the pedagogical competencies of the academic teaching staff;**

1. (Topic 4.1.) To ensure the development of self-assessment tools and a platform for the assessment and improvement of the pedagogical competencies of the academic staff
2. (Topic 4.2.) To promote the implementation of the already existing methodologies in the practical activities of RTU teaching staff and to develop innovative educator?/student-centered methodologies for the improvement of the study process;

3. (Topic 4.3.) To ensure academic staff and students' participation in technological education, including professional ethics and professional development.

Novelty. The scientific excellence and novelty of our research is based on its orientation towards creation of new knowledge, tools, prototypes, methodologies and recommendations for policy makers in Latvia, which is based on research results of global level.

The target audience of the project: 1) academic staff ***of all Latvian and partners higher education institutions***, but ***especially engineering, health care, agriculture, etc. study profiles***; 2) education policy makers.

The **uniqueness** of this project relates to the fact that the results will be obtained in a complex multi-component environment with significant and practical use for higher education institutions.

The research will follow the **ethical principles:** 1)to recognise and respect the independence of the individuals, his or her freedom to participate or refuse to participate in the research; 2) to provide the (potential) study participant with sufficient information; 3) to protect anonymity, confidentiality and privacy of the research participants.

3.3. Participants

RTU has 10 participants

3.4. Methodology

1) a mixed study design has been selected to identify the needs and achieve the results, which include: *obtaining quantitative data*; *collecting qualitative data*

2) the development of a new methodology, which has resulted in the development of descriptors for enhancement of PCAS covering content design of micro modules for the practical use in HE.
3) *The development of a prototype of an innovative model for assessment of PCAS* allows to approbate the model.

3.5. Instruments

3.6. Period of time **Five years (2023-2027)**

3.7. Partners

The project introduces a model of inter-institutional cooperation in Latvia for assessment of PCAS in universities. Each WP **involves cross-sectoral and cross-institutional collaboration, providing a unique experience for further cooperation** of partners in national and international levels, e.g in the European University of Technology, EUt+ project EPP-EUR-UNIV-2020 https://agora.univ-tech.eu/org/portal/15632).

Cooperation with MoES's (Ministry of Education and Science of the Republic of Latvia) and developed a new academic career framework in Latvia in line with European and international good practice will be used as the basis of current research for the development of scientific background and innovative system for assessment of PCAS.

4. Outputs and Outcomes

RTU specific Activities for first five years

Planned activities, resources required, specific indicators, mobility of researchers, offers for postgraduate students, support of early career stage researchers, technology transfer activities, milestones, reports

WP1 Topic 4.1

WP2 Topic 4.2.

WP3 Topic 4.3.

WP1 Topic 4.1	*2023*	*2024*	*2025*	*2026*	*2027*

Development of criteria and indicators and creation of descriptions					
Platform development and maintenance					
Approbation of the pedagogical competence assessment system of the academic staff					
Development of recommendations for system implementation					
WP2 Topic 4.2					
WP 3 Topic 4.3.					
Dissemination activities					
RTU Methodological Conference organization, experience sharing and knowledge transfer in practice.	*2 April/ October*	*2. April/ October*	*2 April/ October*	*2 April/ October*	*2 April/ October*
publications	*3*	*3*	*3*	*3*	*3*
Participation in Conferences, workshops (Travels, accommodations)	*3*	*3*	*3*	*3*	*3*
Summer schools, workshops	*1*	*1*	*1*	*1*	*1*

***Results WP1*:**

1. A data set, including theoretical substantiation and initial data from empirical research, which will be publicly available to facilitate the development of open science.
2. A conceptual substantiation of PCAS has been prepared and will be included in final report of the project.
3. Developed descriptors for PCAS enhancement covering content design of micro-modules;
4. Developed PCAS assessment methodology;
5. Developed prototype of an innovative model for assessment of PCAS, ensuring the approbation of the developed content and technological tool;
6. Updated content of self/other-assessment test and descriptors of an innovative model for assessment of PCAS covering micro-modules design;

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7. Developed recommendations for implementation of an innovative model for enhancement of PCAS in HEI of RL and policy makers.
8. Developed public website;
9. High-quality publications submitted for publication in journals and conference proceedings included in Web of Science Core Collection and SCOPUS databases (12 publications in total);
10. Defended 1 Doctoral Theses, 2 Master papers;

Organised informative events and work seminars in summer schools (4 events) and organised 8 Methological conferences

5. Impact of the project

The deliverables of the research project – methodology, tools, prototype and recommendations for policy makers will be useable at the state level and for HEI (individual and institutional levels) and will provide an impact of the results on transformation of PCAS assessment in HEI. The conclusions will be disseminated via **online communication platforms (**ensuring OPEN access and OPEN data; webinars for specific target groups, e. g. PhD and MA students, PhD candidates, academic staff, their managers etc.; 2)

The project envisages application and participation in new projects using the results obtained in this project, including current RTU cooperation in the European University of Technology, http://agora.univ-tech.eu/org/portal/15632

In order to achieve the socio-economic impact and publicity of the results, the project is implemented in close cooperation with the Ministry of Education and Science of the Republic of Latvia, because an expert from the Ministry of Education and Science with experience in the implementation of World Bank projects related to reforms in the career development of AI academic staff is involved in its implementation. The recommendations developed within the project will be offered to the Ministry for the development of new regulatory documents. Such close cooperation with policy makers will ensure the dissemination of the research results, including successful dissemination of the offered recommendations in Latvia and will provide implementation opportunities in Latvian HEI. The development and approbation of the innovative prototype model for enhancement of PCAS and its methodology will ensure the added value increase of the offered technologies, materials and processes.

6. Future directions

7. Fundings and resources

Operational budget, resources required, access to research infrastructure, …

	2023	2024	2025	2026	2027
WP1 Topic 4.1.	*2 000*	*4000*	*4000*	*4000*	*4000*
WP2*-Topic 2.2.*	*2 000*	*4000*	*4000*	*4000*	*4000*
WP3 Topic 4.3.	*2 000*	*4000*	*4000*	*4000*	*4000*
Dissemination activities	*6 000*	*5000*	*5000*	*5000*	*5000*
Project management *(project manager, assistant, accountant, travels)*	*8 000*	*8 000*	*8 000*	*8 000*	*8 000*
Furnishing new workplaces (2 computers, 2 laptops computer desks, computer chairs, printer, scanner etc.)	*4 000*	*4000*			
Project implementation	*24 000*	*24 000*	*20 000*	*20 000*	*20 000*
Scholarship for PhD student *12 months x 2000 EUR*	*24 000*	*24 000*	*24 000*	*24 000*	*24 000*
Scholarship for Master student *12-month x 1000 EUR*	*12 000*	*12 000*	*12 000*	*12 000*	*12 000*
SCholarships	*36000*	*36000*	*36000*	*36000*	*36000*

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2.5. A research project at Tertiary Education drawing on Transdisciplinary

State of Art

Key points:

- According to Nicolescu (2010), there is no one objectivity/reality, thus knowledge is forever open. Transdisciplinarity offers a new way of producing knowledge, which influences teaching and learning practices. Moreover, Nicolescu (2012), states that the Hidden Third (which is the space among disciplines and between academy and civil society) mediates the Epistemology and Reality, while “the intent is to integrate many levels of truth while generating new Transdisciplinarity knowledge” (p. 9).
- Combining the above mentioned with the fact that complex challenges require complex solutions, Transdisciplinarity and trans-cultural pedagogies are employed in this multi-voiced project (Siemens, 2007)involving EUt+ universities, to inform teaching and learning practices as the most effective approach in support of critically thinking and acting university students and instructors.

1.1. Keywords:

Tertiary Education, Critical Literacy, Critical pedagogy, Transdisciplinarity, Design based research

2. Reasons/ arguments/ motivation for doing the project

Teaching languages for Academic Purposes to students who come from different fields of studies, we realize that the main challenges our students face are mostly related to the lack of several skills and knowledge (apart from language). Moreover, we realize how important it is for students to obtain the identity of a critical literate person, and how crucial for the achievement of this goal, is the incorporation of Transdisciplinarity.

Focusing on the “Hidden Third”, we follow the principle that a new way of producing knowledge can influence both the teaching and learning process (Nicolescu, 2012), situating the participants’ “voices” (New London Group, 1996) in the center of the project.

Combining our research institute’s vision and mission with theories related to Critical Literacy (Baynham, 2002; Fairclough, 2001), student-centered Pedagogies (New London Group, 1996 ; Callaghan, Knapp & Noble, 2014) and the basic principles of Transdisciplinarity (Nicolescu, 2010), we are proposing the current Design-based Research or DBR (Anderson & Shattuck, 2012) project among the partner-universities.

3. Design of research

Design Based Research (DBR) methodology “seeks to increase the impact, transfer and translation of education research into improved practice. In addition, DBR stresses the need for theory building and the development of design principles that guide, inform and improve both practice and research in educational contexts”(Anderson & Shattuck ,2012, p.16). Based on its characteristics, DBR assumes partnerships between experts from diverse academic and research areas which may contribute to the creation of knowledge.

3.1. Scope

- Drawing on Transdisciplinarity and the methodology proposed (DBR) this project aims to develop both theory and practice by promoting collaboration on innovative ideas and sharing of good teaching and learning practices from and within different disciplines.

3.2. Objectives

The core-objective of the proposed project is to develop participants’ competence and knowledge so as to become critical readers, researchers, writers and presenters, by drawing from theories from multiple disciplines and cultivating skills transferable within these disciplines.

3.3. Participants

- The research team (instructors -academics/specialists from various disciplines, professionals students)
- The students attending the courses in which the project will be implemented.

3.4. Methodology - Steps

- Meetings of the research team – design of the project
- Presentation of the project to the Eut+ partners
- Call for participation to the EUt+ partners

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- Meeting with the interested EUt+ partners to exchange ideas and modify the project according to the socio-educational contexts)

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Implementation of the project

- Stage 1: Needs Analysis with students & instructors
- Stage 2: Redesign of the project (taking into consideration the results of the needs analysis).
- Stage 3: Implementation of the intervention
- Stage 4: Critical reflection
- Stage 5: Presentations (experiences obtained through this process, application of the research findings in other contexts, etc)

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- Data analysis - Improvement of the intervention.
- Dissemination of the results

* The current project consists of cycles. Each cycle informs the next one.

3.5. Instruments

- Online questionnaire
- Classroom participatory observations
- Interviews -focus groups
- Participants' Texts (e.g. Reflective diaries, classroom data)

3.6. Period of time

The project is expected to run for a period of 5 years.

- Research & development of the initial design
- Implementation and evaluation of the design
- Re-design,implementation and evaluation of the improved intervention
- Reflection and redesign

3.7. Partners

All partner-universities are welcome to participate.

4. Outputs and Outcomes

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The creation of a student-oriented community of practice, which will be continuously updated by research results, teaching, learning, and researching practices, participants' experiences & new ideas.

5. Impact of the project

The emergence of new knowledge on innovative teaching and learning practices based on Transdisciplinarity.

6. Future directions

The creation of a research prototype involving constructive collaboration and interaction among the different academic disciplines of EUt+ partner-universities and possibly among other institutions The prototype aspires to uncover relationships between the variables that come into play in educational/ professional contexts and generate heuristics for enacting innovations transferable to multiple settings.

7. Fundings and resources

Funding will be used to address the following needs:

- Software applications (NVivo, SPSS)
- A communication app (zoom - unlimited)
- A platform or a cloud (storage of the material etc)
- Meetings, webinars

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A2.6 Decoding the Disciplines: Inclusivity and Intellectual challenge

1. State of Art

1.1. Keywords: intellectual deficiencies, instrumental enrichment, decoding the disciplines

2. Reasons/ arguments/ motivation for doing the project

Every year technological progress shifts available jobs towards more and more challenging intellectual level. European industry is missing specialists and tries to compensate it over immigration of clever people from poor countries. This solution has only a short positive effect and definitely negative effect on the development of poor countries and doesn't reach the main goal: overall enhancement of education level in modern society. We have to take seriously intellectual deficiencies of our students and to care about integration of students from deprived learning environments if we wish that high education keeps up with technological progress.

The equality and inclusivity is a big issue in contemporary education. There exist numerous programs for motivating women and students from poor families. Support for new students focuses on financial and psychological aspects (coaching, motivation, self-organization, self-discipline) and missing basic knowledge offered in so called bridge courses. However many students are also missing important basic intellectual abilities such as pattern recognition, logical reasoning, taking perspective of others, structuring, flexible problem-solving strategies. These abilities are not only crucial for successful learning but they are also beneficial for educating a sustainable society. It is not very popular to speak about missing intellectual abilities. Existing initiatives which cope with this issue, e.g. Feuerstein Instrumental Enrichment (FIE) (ref 3), typically specializes on school-aged children and don't address the higher education, at least not in Europe.

Our research project aims at adaptation of FIE to high education based on deep analysis of student's deficiencies via Decoding the Disciplines method (ref. 1,2).

3. Design of research

3.1. Scope

Every experienced teacher is familiar with particular places in his courses where significant numbers of students are unable to adequate perform essential task. Such places are called bottlenecks (ref 1). Decoding the Disciplines is a well established method to cope with such bottlenecks through a number of steps one of them being a decoding interview with a teacher which leads to a deep analysis of necessary skills. The comparison of bottlenecks through different disciplines shows similarities and connections to student's missing fundamental cognitive skills (ref 4). The insights from progress in Decoding Community can now be paired with another well established method: Feuerstein Instrumental Enrichment (FIE) (ref 3).

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FIE was initially developed to help children from learning-deprivated environments to enhance their cognitive abilities and learning strategies. It was then expanded to include other groups, such as neurodiverse children, immigrants and students from cultural minorities. The method bases on context-free cognitive tasks and strong mediation by the teacher. Recently adaption to STEM on the school level was done.

Our project aims at adaption of FIE tools using insights from Decoding Community with focus on basic first-year courses in mathematics, physics and computer science. It can be easily extended later over all other disciplines as it deals with fundamental thinking skills and uses discipline-unspecific methods.

3.2. Objectives

1. Collect and make systematic review of bottlenecks in STEM.
2. Analyze possible connections between collected bottlenecks and intellectual deficiencies as categorized by Feuerstein.
3. Develop corresponding concept questions/assessments which can reveal missing fundamental intellectual skills.
4. Examine whether these deficiencies are similar across different EUT+ partners.
5. Analyze the possible sources of the inter-european differences and means to profit from exchange between the partners.
6. Develop activities and learning materials suitable at high education level aiming at correcting deficiencies in fundamental thinking skills.

3.3. Participants

The research team, the students and teachers from EUT+- Partners.

3.4. Methodology

We combine quantitative data from assessments with qualitative analysis done through Decoding Interviews.

3.5. Instruments

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Interviews with educators and learners, static analysis of assessments.

3.6. Period of time

5 years

3.7. Partners

EUT+ Universities; external coaches on Decoding of Disciplines.

4. Outputs and Outcomes

7.2 Decoding Disciplines,Inclusivity and intellectual challenge	*2023*	*2024*	*2025*	*2026*	*2027*
Establishing and support of EUT+ Decoding Community					
Systematization of bottlenecks, analysis of corresponding intellectual deficiencies					
Development of assessments for refining the bottlenecks and revealing intellectual deficiencies					
Adaptation of the Instrumental Enrichment Tools					
Approbation of the adapted Instrumental Enrichment Tools					
Dissemination activities					
publications		*1*	*1*	*1*	*2*
Participation in Conferences, workshops (Travels, accommodations)	*2*	*2*	*2*	*2*	*2*
Summer schools, workshops	*1*	*1*	*1*	*1*	*1*

Outcomes are

1. Established EUT+ Decoding Community
2. Systematic catalog of typical bottlenecks in open access
3. Assessments for refining the bottlenecks and revealing intellectual deficiencies
4. Instrumental Enrichment Tools adapted to context of basic high education STEM courses

5. Impact of the project

Teachers and Students are often suspicious to the didactic initiatives considered to be very far from concrete problems. Starting with Decoding of existing bottlenecks our project has a high potential to be accepted as being helpful in overcoming intellectual deficiencies. Tacking intellectual challenge serious and proposing concrete tools like Decoding the Disciplines and adapted FIE will have an overall positive effect on teaching community and contribute to change of mind-set from destructive criticism of students being stupid and school education insufficient towards constructive reflection and research on the learning and teaching.

6. Future directions

Missing fundamental thinking skills manifest themselves in similar manner across all the disciplines. After focusing the Adaptation of Instrumental Enrichment in context of mathematics and physics we we will expand our research field to other STEM disciplines and foreign languages.

7. Funding and resources

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5. ERASMUS+ KA2 Project 2016-2019 Decoding the Disciplines in European Institutions of Higher Education: Intercultural and Interdisciplinary Approach to Teaching and Learning;

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1. State of Art

One of the main obstacles posed to contemporary education, and hence to teaching, learning and the overall effectiveness of educational practices, is the noticeable distancing of the educational process from the dynamics of everyday life – from the lifestyle and the attitudes of the modern young person, disregarding the key place that technology and communication through digital tools holds nowadays.

1.1. Keywords:

higher education, learning, teaching, self-study, new pedagogical and methodological approaches and concepts, interdisciplinarity/ transdisciplinarity, neo-pedagogy/ ”vision methodology” of teaching

2. Reasons/ arguments/ motivation for doing the project –

Our proposal for reconsidering the visual component in the presentation of theoretical material and scientific information intended for teaching in higher education has been prompted by the above-mentioned observation concerning the essential gap existing between the reality of everyday life and the reality of the classroom. Figuratively speaking, the "gap" for the young people (students) is revealed with the switching off of their mobile devices when entering the classroom and opening their conventional paper notebooks and coursebooks. We have therefore set ourselves the objective to shorten, or even, bridge this gap between these two spheres. It is our main conviction that the way to do this goes through technology and digital tools, which will significantly increase interest, raise motivation, stimulate creativity and critical thinking. It will also contribute to reconsidering scientific knowledge, enhancing learners' scope of information, and creating new pedagogical skills for the educators who will re-experience scientific information that is "stuck" within its routine presentation to the audience. The main parameters of the proposal are related to the new/innovative presentation of specialized scientific information, thus increasing the interest and encouraging the involvement of learners in the teaching and learning process, while stimulating at the same time an atmosphere of creativity, collaboration, discovery, practical applicability of knowledge, and last but not least, making the product of knowledge tangible. The long-term goal will be achieving better results at mid-term and final assessment.

3. Design of research –

The project will make it possible, on the one hand, to carry out serious research work (such as examining the current situation, pointing out the strengths and weaknesses, conducting surveys and analyzing the opinions of educators and learners, clarifying the problems and opportunities for improving the situation, etc.). On the other hand, it will ensure further conducting experiments and setting up a theoretical paradigm that can be piloted and trialled in a practical environment, where working techniques, methods and methodologies can be implemented in the pedagogical practice of teaching in higher education.

3.1. Scope -

The project will involve undergraduate, postgraduate and doctoral students of engineering and non-engineering specialties, as well as a wide range of educators from various disciplines taught across the Alliance universities.

3.2. Objectives

- Synchronizing pedagogical practices in line with the contemporary realities and the immediate needs of the present day;
- Creating an attractive, creative and flexible methods of instruction, entirely learner-centered, and focused on their individual characteristics and needs;
- Reconsidering and reformatting scientific knowledge through the prism of the visual (not just by means illustrating, but first and foremost by means of devising a completely new way of communicating such a specific and sophisticated sort of information as the scientific knowledge);
- Creating teaching modules, adaptable to disciplines from various fields of knowledge and areas of science;
- Organising pan-European learning platforms accessible to students on any Alliance campus.

3.3. Participants –

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The project will involve students from a wide range of disciplines, as well as lecturers in a wide range of disciplines. The aim is to make a valuable exchange of pedagogical experience and best practices on the path of transdisciplinarity, achievable through the development of methodologies that integrate the experience and practice of the different disciplines and go beyond the boundaries of the narrow specialization.

3.4. Methodology –

Research, systematizing of data (accessible to all project participants), trialling and analysis, publication and dissemination of results, drawing conclusions, implementation of the working strategies into the practice of the real instruction – both for face-to-face and online formats of teaching and self-study.

3.5. Instruments –

Classical pedagogical tools and methodologies transformed through the prism of using the digital tools in real and electronic environments, creating new tools with the active participation of engineering students who will be co-authors in the creation of neo-pedagogical practices in higher education.

3.6. Period of time –

Five years (2023 - 2028).

3.7. Partners -

EUt+ (representatives of the other research directions), alumni working in digital technologies, video content creation and animation, e-media.

4. Outputs and Outcomes – Creating a database with the conducted experiments and their results, making publications, organizing workshops and round tables, creating digital tools and modules to be implemented in a real educational environment.

5. Impact of the project –

Reconsidering the educational process, as well as the entire set of techniques and methods for presenting scientific information through the co-creation of educational units (lesson, series of lessons, tests, exam platforms)

6. Future directions –

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Developing and transforming classical teaching content and creating a new vision of scientific information with the active role of students, particularly PhD students, establishing a European learning product bearing the EUt+ brand.

7. Fundings and resources –

The successful realization of the project will require a wide range of technical means, such as computer equipment and specialized software for video editing and animation, photo and video equipment for filming, 3D visualization tools, equipment for laboratory space with 12-15 workstations, a separate space for creating videos for teaching purposes, etc.

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A2.8 The transition towards a pedagogy for transdisciplinarity through exercises (applications) of urban ecology

The premises from which it starts:

a. Transdisciplinarity involves the use of information from several specialized fields and their "melting" in new, higher-order meanings, through processes of increasingly advanced synthesis of cognitive schemes, concatenation and upgrading of scientific perspectives; in terms of the DIKW knowledge hierarchy model, transdisciplinarity involves the mental approach of evolution from disparate data (D and I) to knowledge and wisdom (K, W).

Thus, transdisciplinary contents are not equivalent to an algebraic sum of monodisciplinary knowledge. Similarly, the pedagogical approaches for transdisciplinary approaches, even if they support and start from monodisciplinary ones, are not reducible to them: they have a different specificity, address other levels of mental functioning, assume other stages, claim other skills and aim for other purposes. It's the difference between an algorithmic approach and a creative-heuristic one

b. University training, to be sustainable, needs mental openness, values and work skills in the spirit of the transdisciplinary approach, a learning of specific practices for teachers/ students/researchers alike. At the university level, the pedagogy that guides the transdisciplinary learning approach is in a stage of fragmentation. For the coagulation of a pedagogy of transdisciplinarity, adaptations of the contents, didactic paths, teaching/learning methods, purposes, particularities of the assessment tools to the transdisciplinary specifics, etc. are necessary:

The purpose of the research direction: articulating a pedagogical approach to university learning for transdisciplinarity.

The **objectives that the research direction pursues**:

- the proposal of a pattern of constitution of the transdisciplinary conceptual body
- identifying the stages and their sequence within a transdisciplinary pedagogical approach
- decanting a body of effective teaching/learning methods for the transdisciplinary approach
- the identification of patterns of learning goals specific to the transdisciplinary approach
- building some methods/tools for evaluating the results of the learning activity

The pedagogical context of the project

Using a mixture/ melting of educational perspectives:

- Universal learning design, social constructivism, the DIKW model of informational structuring, experiential learning, transformative learning circular pedagogy, collaborative learning, games-based learning and gamification. etc.

- the use of a technological diversity - wearables, coded devices, augmented reality, social media, tablets (iPads), student-owned devices (BYOD), student-generated multimedia, cloud technologies, mobile games and apps, enterprise-wide mobile platforms, the Internet of Things and sensors) but also some models of technological integration in classes (eg the SAMR model, TPACK framework).

Guidelines for the learning process:

- Learning by constructing new meanings

- The need to multiply and nuance representations

- critical reflection

- The value of co-learning

- The value of personal experience and increasing student engagement

- Adaptive teaching

- value-based learning

The ***transdisciplinary field of study*** to which the pedagogical approach will be applied is **urban ecology for students**.

Target group: the implementation of the project includes several categories of participants:

a. University teachers: specialists in the field of educational sciences in a team with teachers of specializations related to urban ecology: biologists, chemists, physicists, architects, computer scientists, economists, plastic arts, socio-human fields (social workers, journalists), and not only.

b. Students of these specializations

c. Pre-university teachers and students, representatives of the local community/labor market

Work methodology

- the proposal of learning sequences in which to alternate monodisciplinary learning stages with transdisciplinary approaches, moving from working in homogeneous disciplinary teams to working in multidisciplinary teams, under the supervision of the mixed team of specialists. Each learning sequence will be analyzed through quantitative and qualitative methods from the perspective of pedagogical efficiency

The proposed *learning sequences* are intended

- transmissions and theoretical assimilation of information

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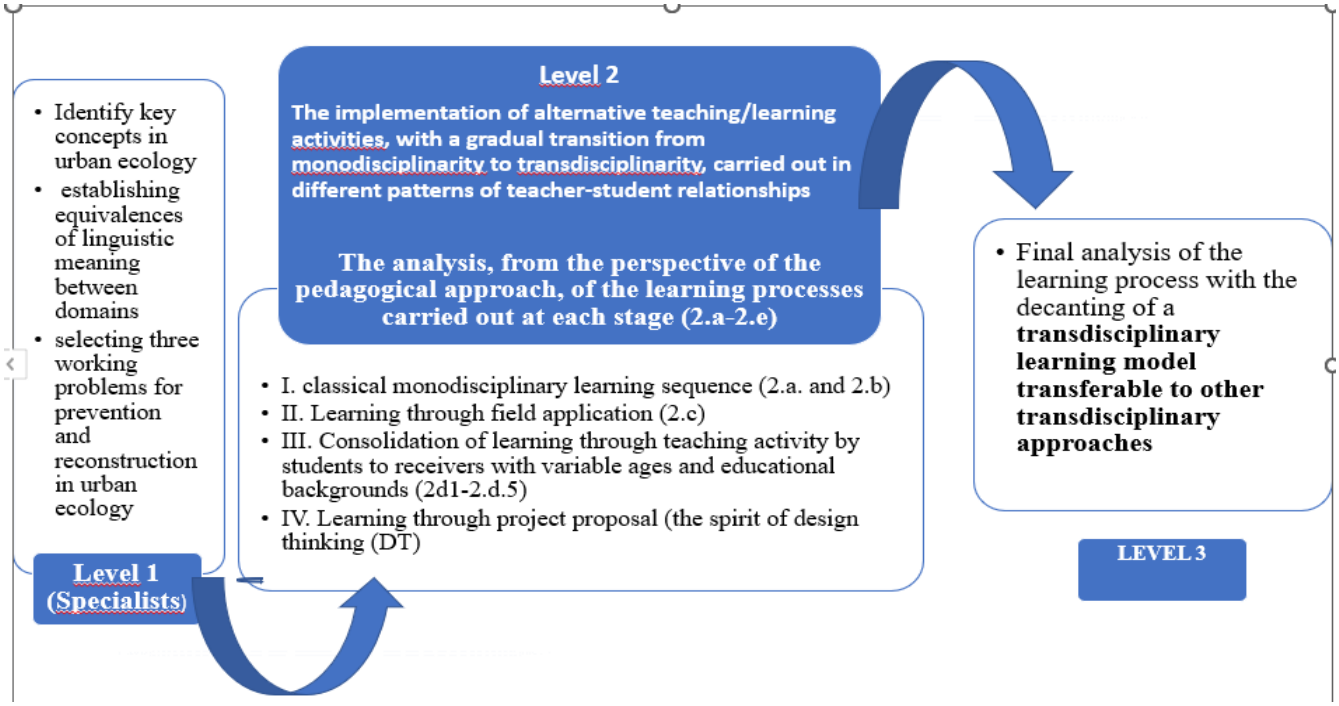
- their consolidation through application in their own field of activity and then application in fields different from the specific field

- information syntheses and knowledge transfer towards an inter/transdisciplinary environment

The phasing of the learning sequences will be done on three levels. In a concentrated formula, the whole approach could be summarized as follows:



Level 1

Working group with specialists in the areas tangential to urban ecology (contributes with the specific contents of the field) in collaboration with specialists in the fields of education (contribution of teaching know-how - methods, didactic strategies, assessment tools, etc.) and IT specialists (know how teaching tools)

Tasks:

- ✓ the selection, from the range of urban ecology problems, of 3 work problems that have applicability for students in the application city
- ✓ establishing the key concepts for urban ecology from the perspective of one's specialty (the concepts attached to the selected work problems).

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- ✓ Analysis of the meaning of the concepts for the specializations involved and the realization of terminological equivalences (=nuance of representations from the perspective of universal learning design).
- ✓ Selection of the conceptual body of work for students and the elaboration by the teachers of each specialty of some work materials for the selected conceptual body: ppt presentations, tutorials, creating tutorials, etc. (expertise of education and IT specialists)
- ✓ proposing potential work tools for urban ecology (specific to each specialization)

The duration of this level – 2 months

Level 2

Mixed work groups, a team of specialists and students from all specializations:

- ❖ 2. a. Presentation of the work summary of level 1. (whole group activity)

- familiarization with the general work task, the stages of the project to be carried out

- presentation of terminological equivalents and working methods

- dividing the students into three groups, each group focusing on a single urban ecology issue. The condition is that in each group there are at least 2 students from each of the specializations included in the activity.

- ❖ 2.b. Work with groups of students from the same field of specialization:

2.b.1 *monodisciplinary learning sequence* in homogeneous teams of specialists, with the three working groups, together. *Teaching content and working methodology for the chosen problem* (e.g. Biology students will manage the content of the vegetal, faunal ecosystem – they will learn plant species, birds, invertebrates, their habitat characteristics, what these species indicate for the quality of the ecosystem, etc. methodology used for data collection, the necessary tools - eg existing computer programs for species identification (informatics students can contribute their expertise); chemistry / physics students - methods for determining the quality of the environment from the perspective of the presence of pollutants, the level of noise; social science students - assessment of needs, of vulnerable groups existing in the area, level of attachment to the place, etc.; architecture and fine arts students - construction design, pragmatic but also aesthetic perspective; economics students - analysis economic potential, the concept of green business, profitability, e tc; engineering students - drawing up maps and databases collected in the GIS system; journalism students – promotion, warning, fund-raising campaigns) etc.

2.b.2**. Analysis of the learning process from the ongoing stage** (2.b.1.)

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- self-analysis of learning by students

- analysis of learning from the teachers' perspective

The analysis criteria: information assimilated, skills formed, the degree of learning autonomy, the feeling of personal efficiency, barriers to learning, transversal skills acquired, the efficiency/degree of accessibility of the teaching methods used, etc.

- evaluation of the learning results with the tools proposed by the specialists in the educational fields

The most effective working methods, didactic and IT tools, etc. will be decanted. The feedback obtained (from specialists, students) and the derived conclusions will be included in the learning of subsequent stages

Duration of 2.a.-2.b.: 4 months

- 2. c. *the sequence of learning by applying knowledge and practicing skills* - experiential monodisciplinary approach

2.c.1- field activity with the application to the work problem situation of those assimilated in the previous stage (2.b.1 and feed-back of 2.b.2.). The students of each specialty will make their own applications of the knowledge acquired in the previous stage) in parallel with the applications of the other fields within each working group

- Meetings and exchange of experience of students of the same specialization from the three groups

2.c.2. **Analysis of the learning process of the ongoing stage** (2.c.1) (analysis pattern from 2.b.2)

Duration of stage 2.c.: 6 months

- 2.d. the sequence of *learning consolidating by changing representations* (monodisciplinary approach 2.d.1. and pluri/transdisciplinary 2.d.2-2.d.6). All activities 2.d. they will take place in mentoring relationships with all the specialists of the team, each with their own expertise.

Learning tasks for students:

2.d.1. organizing *teaching sequences - horizontally (peer-group) within one's own work group*: The students of each specialization will present the results of activity 2.c. in front of their own work group. The making of the presentations will be coordinated/supervised by teams of teachers/students from the educational sciences and computer science (a learning activity in itself - ” how” to present, along with ”what” to present)

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2.d.2. Making a synthesis of the work of the whole working group starting from the results of each specialization in the group. Carrying out a SWOT analysis for the urban ecology problem assigned to the group, the synthesis in which the perspective of each specialization can be found. Analysis of possible ecological prevention and remediation solutions

- The meeting of all three working groups and the presentation of this synthesis

2.d.3. organizing *some teaching sequences - horizontally* (*peer-group)* presenting the synthesis 2.d.2. for the students of their own specialization

2.d.4. the organization *of vertical teaching sequences* - through tutorial activities, in partnership with pre-university teachers, the students involved will present the results of the 2.d.2 synthesis to pre-university students (high school and gymnasium) using interactive teaching methods. (Teaching will be coordinated/supervised by teams of teachers/students from educational sciences and computer science majors)

2.d.5. *organizing teaching sequences for decision-makers from the local community/labor market* using interactive teaching methods (under the coordination/supervision of the team of teachers/students from the specializations of educational sciences and computer science). Content presented: synthesis 2.d.2

Formative role of 2.d. activities for students: Teaching activities adapted for different educational and professional levels (2.d.1.- 2.d.5) (according to the DIKW model of knowledge) offer the advantages:

- Repetition and consolidation of data and information (the old pedagogical precepts otherwise valid, that repetition is "like the mother of learning" - supporting levels D and I of the DIKW model)

- The change of roles (from that of a student to that of a teacher) implies an exit from the passive monodisciplinary space towards a transdisciplinary activism and leads to additional information processing, the inclusion of information in new contexts and cognitive schemes, of multiplying representations (UDL model) formation of new directions for the same information provide access to the K and W landings of the DIKW model

2.d.6. **Analysis of the learning process from the ongoing stage** (2.d.1-2.d.5) according to the model 2.b.2)

Duration of stage 2.d.: 6 months

❖ 2.e. Transdisciplinary learning task – carried out by each of 3 multidisciplinary teams of students under the supervision of specialists

2.e.1. *Learning task: Proposing a transdisciplinary project of prevention and reconstruction on the* assigned *problem* of urban ecology. The guiding pedagogical model for carrying out the task - the one proposed by Design Thinking (DT) (defined as a human-centered problem-solving approach to deal with "wicked" challenges.

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Presentation of this project

2.e.2. **Analysis of the learning process from the ongoing stage** (2.e.1)

Duration 12 months

Level 3.

The final analysis of the learning process carried out, with the ***decantation of a transdisciplinary learning model.***

Activities:

3.1. *Analysis and processing of the pedagogical data obtained*. Starting from the data collected in each of the stages 2.a-2e regarding the learning process, based on the selected criteria (respecting the data collection methodologies specific to the educational field) the observational data recorded during the activities, the feed-back analysis - given along the way by specialists/students, quantitative and qualitative analyzes will be carried out that will lead to the drawing of conclusions regarding:

- the ways of building the conceptual body of synthesis necessary for learning for transdisciplinarity,

- highlighting the stages and their sequence in a transdisciplinary learning design

- proposing a body of effective teaching/learning methods and learning tools (IT and not only) for transdisciplinarity

- the identification of optimal educational relationship patterns in horizontal relationships (peer-group from the same specialization but/ and especially from different specializations) and vertically (students-teachers- labor market) in the approach of forming learning communities

- identifying the specific goals of a transdisciplinary education and providing specific tools for evaluating the acquisitions of this approach.

3.2. **Building a transdisciplinary teaching/learning model** transferable to other transdisciplinary fields; opening the perspectives of building a Living Lab on the theme of sustainable transdisciplinary learning in universities

Duration: 6 months

Expected purpose and future directions:

The development of a teaching/learning strategy model for transdisciplinarity specific to university education, a model with a high level of transferability to other transdisciplinary fields in universities

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A2.9 Building an e-community for PhD students in the European University of Technology (EUt+)

State of Art

Key points:

- The context of our initiative is the creation of the first e-Community of Practice (e-CoP) for PhD students among the European University of Technology (EUt+) alliance.

- The directions identified will encompass new ideas and strategies which will be proposed by future new members or by present participants.

- Based on those research directions, we will organize research symposiums, colloquiums, workshops, webinars, etc.

- Regarding the paradigms of approaches in research directions, this research project will implement the social constructivism paradigm.

1.1. **Keywords**: e-Community of Practice, PhD students, networking, European University of Technology

2. **Reasons/ arguments/ motivation for doing the project / background**:

According to Kirschner and Lai (2007), a Community of Practice (CoP) is considered to be a physical or virtual entity as well as a process where social learning occurs (p. 128). The term was coined by educational theorists Lave and Wenger (1991) in their pioneering book "Situated Learning: Legitimate peripheral participation". These communities are composed of people who share mutual interests and thoughts, and who wish to exchange ideas in order to solve problems or tackle common challenges. In fact, Wenger (2011) says "Communities of practice are groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly" (pp. 1). People seem to share an inherent need to belong to a community which is proven by the fact that communities are developed in many sectors, like in industries, in professional associations, in the government, in educational circles, etc.

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Research has shown that PhD students' doctorate experience is improved when students develop social relations and networks. However, according to Mantai & Dowling (2015), there is a gap concerning the empirical research conducted revolving around the types and purposes of social connections that support doctorate students in this challenging journey. This study aims to fill in the gap by supporting PhD students and supervisors of all the Universities that participate in the European University of Technology (EUt+). The EUt+ alliance is still in its preliminary phase which is why it is deemed necessary to explore the existing foundations and provide a united territory for the future PhD holders of this community.

The study looks to establish an online support platform for PhD students and supervisors from all the EUt+ partner-Universities. The team will build on their experience and research what information is required and in what format. This information will help us map out the challenges that are posed by pursuing a PhD, explore and implement ways that EUt+ can provide support.

The research team consists of PhD candidates at different stages of their studies. The idea of the current project was derived from the researchers' experience during their PhD journey, and more specifically it emerged from various problems they faced (e.g. time management, data management, etc). Due to the abovementioned, the researchers considered the high value of both mapping relevant issues and finding solutions through an online community of practice (consisting of PhD students and their supervisors), which could connect people from several parts of Europe.

3. **Design of research**

3.1. **Scope**: Explore issues of support, networking, funding opportunities, sharing best practices among EUt+ PhD students and their supervisors

3.2. **Objectives**: to map relevant issues and find solutions through an online community of practice (consisting of PhD students and their supervisors), which could connect people from several parts of Europe.

3.3. **Participants**: PhD students and supervisors from the 8 partner universities of the European University of Technology (EUt+)

3.4. **Methodology**: An exploratory Case study

Stage 1

From August 2022 till September 2022 the researchers will disseminate the online questionnaire to the PhD students that are willing to participate in the study anonymously, of all partner-universities (see Appendix 1). The collection of data (Stage 1) of the current research can only be achieved

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through an online questionnaire due to the fact that the participants come from 8 different universities in Europe.

At the end of May 2023, the researchers will gather the participants' answers. The next step will be the data analysis which will last for a month (June 2023). At this stage the researchers will utilise a quantitative analysis. The statistical analysis will be made with SPSS 25.0 version. The statistical analysis proposed for the current project is ANOVA, because differences between several groups of students will be explored and eventual statistical significant results will be discovered. Furthermore ANOVA offers flexibility of the analytic procedure (Tabachnick & Fidell (2007) and for a comparison of more than two groups means the one-way analysis of variance (ANOVA) is the appropriate method instead of the t test (Kim, 2014). The results will be utilised in the next stage of the current research in order to conduct qualitative analysis (focus groups interviews).

The aim of this process is to extract quantitative results regarding the participants' needs (problems/ challenges they are facing etc), which will be utilised in the next stage of the current research.

Stage 2

The second stage involves the conduct of focus group interviews. The number of participants in the focus groups will be determined after the completion of the questionnaire submission. In the questionnaire (question 14, see Appendix 1), participants are asked if they would like to submit their e-mail if they wish to learn more about this initiative. During June 2023 (based on the results of the quantitative analysis which will have been already finished), the conduct of online focus groups will take place, where the PhD students and their supervisors will participate. After the collection of all the data, the research team will analyse them, (during September 2023 and October 2023) implementing the Constant Comparative Method (Tsiolis, 2014). The specific approach of data analysis was purposely chosen by the researchers, both due to the limited literature regarding the specific topic and the fact that at this stage qualitative results are necessary, to achieve an in-depth investigation of the phenomenon.

As it was mentioned above, the exact content of the questions that will be used in the focus groups will be modified by the quantitative results that will come up through the first stage of the research process (through the online questionnaire). The core-questions are listed in Appendix 2.

It is estimated that every focus group will last approximately two hours. Every person will participate in one focus group. The discussion will be audio-recorded, subject to the condition that all the participants agree. The participation is anonymous and no personal details (apart from the field of studies and the stage) will be used by the researchers.

The researchers will function as coordinators of the discussion, asking clarifying questions (e.g. could you please explain what do you mean? Could you please give an example? Is it possible to explain your statement further?) and encourage silent participants or the participants who do not actively participate. The researchers will not intervene in a direct or indirect way and they will not express

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their ideas/ perceptions / attitudes about the topic of the conversation or the opinion of the participants in order to not affect the results.

Stage 3

The final stage of the research process will be the combined analysis of both the quantitative and qualitative results. The main aim of this stage is to obtain a "clear picture" of the phenomenon under study. The results will be communicated to the participants of the research in December 2023.

The ethical concerns that need to be addressed will centre around confidentiality as the study includes both students and supervisors - particularly ensuring the anonymity of the participants where applicable and the need to ensure that researchers' own bias is excluded/identified correctly.

3.5. **Instruments**: Quantitative data (online questionnaire answers) and qualitative data (focus group interviews) will be collected. The timeframe for the questionnaire is from August 2022 to December 2022. The focus groups interviews will be conducted in March 2023.

3.6. **Period of time**: August 2022 – August 2024

3.7 **Partners**: Cyprus University of Technology, Darmstadt University of Applied Sciences, Riga Technical University, Universitatea Tehnică din Cluj-Napoca, Université de technologie de Troyes, Technological University Dublin,Technical University of Sofia, and Universidad Politécnica de Cartagena.

4. **Outputs and Outcomes**: The creation of an e-space/ e-Community of Practice (e-CoP), a platform for PhD students.

5. **Impact of the project**: The project will contribute to the creation of a community for people who share common interests, and aspirations and to deriving new information. Socially, this is a useful opportunity for networking and initiation of future, interdisciplinary collaborations among the community of EUt+.

6. **Future directions**: EUt+ PhD students will form collaborative relationships through joint research, participation in Erasmus+ research projects, mobility exchanges, etc. The results of this initiative will provide useful information for PhD supervisors concerning the PhD territory of EUt+.

7. **Fundings and resources**: No funding at present time. However, funding opportunities might arise in the future.

Maintenance costs will apply concerning the e-platform.

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Funding for future talks, dissemination of information, plenary talks, symposiums, workshops, etc. will be required.

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A2.10 Virtual Reality

Responding to the current socio-cultural and economic context

We are, currently, witnessing tremendous socio-economic and cultural shifts around the world, including the advent of big data, dataveillance, artificial intelligence, nanotechnology, automation, wearable technologies, etc. Our students, from a young age, are surrounded by digital literacy practices outside the classroom, for example, through the use of smartphones, iPads, video games, etc. According to Mills et al., (2023), the exponential expansion of these hybrid literacies in digital contexts in and out of the classroom has a direct implication for curriculum and pedagogy. Critical thinking practice, decoding multimodal texts, questioning information are some of the most

important skills our students need to be considered literate students in the digital era. These material shifts in the students' learning experience and the transition from print-based to embodied learning practices call for three-dimensional teaching and learning through which students will have multisensorial interactions with course content.

Virtual Reality

Education has witnessed more and more sophisticated technologies in the last decade (Kessler, 2018). One of these technologies is Virtual Reality (VR). The use of VR in education has been prevalent for many years but in the last five years VR headsets have become more mainstream (Sadler and Thrasher, 2021). Currently, there are several inexpensive, easy-to-use VR hardware and software options that are well within reach of the average educator (Brown & Green, 2017). It is considered to be very important for our Research Institute to include VR, not only because it is one of the most innovative technologies of the 21st century, but also because VR has been applied in many fields already, which can also respond to the multidisciplinary character of EUt+. VR has been eminently present in medicine, automotive, aerospace industries, entertainment, and of course, education (Hafner et al., 2013).

Some Benefits

Our Research Institute can benefit from the pedagogical implementation of VR in education. Some **benefits** that have been recorded are:

- Increasing student motivation and commitment to the lesson (Martín-Gutiérrez et al., 2017)
- Diversifying the lesson (Dong, 2016)
- Interacting with the content and the learning environment through chatbots (Berns et al., 2018)
- Simulating authentic contexts (Christoforou et al., 2019)
- Intercultural and linguistic awareness among students of different countries and universities (Jauregi-Ondarra et al., 2022)

Hardware and software

VR can offer the sensation of immersion in a 3D environment which students can enter through simulation. The choice of hardware and software is extremely important since it can determine the quality of the lesson. It is a fact that most VR hardware and software was, originally, developed for the gaming industry, however, it has started attracting the interests of scholars and researchers, which makes it mandatory for a Research Institute to include this technology. Educators can choose between these two categories of VR hardware, **tethered and standalone**:

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A) *VR using a smartphone*

B) *Integrated VR Headsets: Tethered*

C) *Integrated VR Headsets: Standalone*

For our Research Institute, we are aiming for options B and C since option A is no longer commercially available. Two examples of option A were *Google Cardboard* and *Samsung Gear VR* with many recorded problems like the overheating of the smartphone and charging time delays (Christoforou et al., 2019). According to Sadler and Thrasher (2021), the best, inexpensive option for a standalone headset is *Oculus Quest 2* (now called *Meta Quest*) with prices starting at $299 for each set. Another option could be *HTC Vive Focus 3*; however, its price could be prohibitive (starting at $1300). It would be more advisable if our Research Institute opted for standalone headsets, not tethered ones, since they are more affordable, they are not tethered to a computer (hence, cheaper) and they come in the form of a cordless HDM (Panagiotidis, 2021).

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A2.11 Developing digital pedagogies through a Pan-University peer observation of teaching .

Responsible: Dr Muireann O'Keeffe, TU Dublin.

State of Art

Keywords:

Keywords: pedagogy, dialogue, Learning environment, teaching practice, philosophy, transdisciplinary,

2. Motivation for doing the project

In recent years we have witnessed a rapid adoption of online learning and teaching practices (Nordmann et al., 2020). This research project aims to provide a framework that underpins the development and transformation of digital teaching practice and pedagogy to enable the growth of the Smart Educator.

We propose the model of Pan-University Peer Observation of Teaching (PoT) to provide a structured opportunities for professional conversations among higher education teachers, through which observation, reflection and dialogue on teaching practice can develop and transform teaching perspectives, while also developing new teaching skills and pedagogies.

The literature shows that university teaching staff are not adequately qualified in digital competences and are therefore not able to adapt their teaching methods to the demands of the current digital era. Studies confirm that teacher professional development is needed to develop skills knowledge and competences to teach in a digital and for the improvement of the teaching–learning processes of students (Fernández-Batanero et al, 2021). We believe that Peer Observation of Teaching can support the mainstreaming of digital teaching practices while enabling learning environments that support student centred and active learning in the 21st century (Crehan et al, 2021).

3. Design of research

We aim to set up an extended action research study that explore how Peer Observation of Teaching can support professional development of digital teaching practices in a Pan-University context. The action research approach develops incrementally over the cycles (and years) of the project, thereby continuously improving the PoT model and continuously impacting on digital teaching practice of the higher education teachers involved.

3.1. Scope

This research aims to invite University teaching staff in all EUT+ partner Universities to participate in a Pan-University Peer Observation of Teaching Project. The project will support the development of relationships and dialogue, thus building a community of practice around digital teaching practices.

3.2. Objectives

- To Build a Community of Practice around digital teaching practices
- To share innovative digital teaching practices
- To foster dialogue and obtain from peer higher education teachers on digital teaching practices

3.3. Participants

Teachers, Learners, Researchers, Academic developers.

3.4. Methodology

This Peer observation of Teaching project will be underpinned by an extended Action Research Methodology (Denscombe, 2010; Robson, 2011) which will provide recommended actions resulting from data reflections to be acted upon and implemented within pedagogical practice.

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3.5. Instruments

The project will require the use of a wide range of data collection methods to gather and analyse data.

The research will also take a flexible approach to add innovative approaches if required as the research project progresses.

a. Questionnaires
b. Observations
c. Interviews
d. Focus group discussions
e. Learning Sets
f. Document Analysis

3.6. Period of time

This proposal requires cycles of peer observation to bring communities of higher education teacher together to teach, observe, reflect, and change practice. Accordingly, this will require comprehensive support, community building, reflection on pedagogy and digital pedagogy and thus creating new models of pedagogies for participants. The developmental nature of the action project necessitates 5 years for its completion.

Year	Title	Activity		Evaluation
Cycle 1	Pilot of peer observation (PoT)	Each partner university invited to nominate 1 teaching staff member to participate	Training on PoT	Evaluation and action research first cycle to answer can PoT foster development of digital teaching practices? Within each cycle we ask how digital pedagogical knowledge and skills have been enhanced

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				and what impact this has on the students experiences and learning environment.
Cycle 2	Findings from Cycle 1: adapt the modus operandi for cycle 2 Run peer observation cycle 2	Widening of participants: Each partner university invited to nominate teaching staff to participate in Pan University PoT	Training on PoT Support for PoT	Evaluation and action research 2nd cycle to answer can PoT foster development of digital teaching practices. Within each cycle we ask how digital pedagogical knowledge and skills have been enhanced and what impact this has on the students experiences and learning environment
Cycle 3	Findings from Cycle 2: adapt the modus operandi for cycle 2 Run peer observation cycle 3	Each partner university invited to nominate teaching staff to participate in Pan University PoT	Training on PoT Support for PoT	Evaluation and action research 2nd cycle to answer can PoT foster development of digital teaching practices. Within each cycle we ask how digital pedagogical knowledge and skills have been enhanced and what impact this has on the students experiences and learning environment

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Cycle 4	Evaluation of the project, generate findings			Can PoT be mainstreamed as a structured opportunity across the EuT+ Universities to develop digital teaching practices?
Cycle 5	Dissemination and publication of work			

3.7. Co-Coordinators

H_da Hochschule Darmstadt; Cyprus University of Technology

3.8. Partners

all EUT+ Universtities

4. Outputs and Outcomes

- An enhancement of digital pedagogical knowledge and skills
- A community of Practice of Digital educators
- Research papers in peer reviewed journals (for example: similar to https://doi.org/10.1080/1360144X.2021.1954524
- Conference presentations
- Erasmus mobility

5. Impact of the project

- Higher education teachers have acquired new digital teaching practices
- Formation of a Community of Practice centred on pedagogy
- Digital skills knowledge and competencies of participants enhanced

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6. Future directions

Pan-University Peer observation of teaching offers an opportunity to build communities of teachers across EUT+ enquiring into their digital teaching practices through involvement in the following tasks:

- Sharing Practice
- Showcasing pedagogical exemplars
- Adaptation of Pedagogical methods
- Scaffolding professional dialogue around digital teaching practices.

This project provides scaffolding and support for real and longitudinal pedagogical change in learning environments, through support, dialogue, reflection, and action. Firstly, this project underpins the development of relationships and community around a conversation of pedagogy, thus supporting the development if the EUT+ wider community. Secondly, this project encourages mobility across the partner universities to experience, share and reflect on digital teaching practices. Finally, and overall, this cross-university project will have an impact of the quality of learning environments for 21st century learners an activity that can continue onwards into the EUT+ future.

7. Fundings and resources

This project requires EUt+ support to be initiated. Targeted Funds: €1,000,000

Required Resources are identified as follows,

- 1 PoT project coordinator
- 1 Phd student
- Equipment
- Mobility
- Reports, handbook, publications

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1. 3 .Ongoing projects :

A3.1. Research project _Systematic Literature review on institutional support provided to the academic staff in their teaching practices and students in their learning process

1. State of Art

The primary purpose of a traditional or narrative literature review is to analyse and summarise a body of literature. This is achieved by presenting a comprehensive background of the literature within the interested topic to highlight new research streams, identify gaps or recognise inconsistencies. This type of literature review can help in refining, focusing and shaping research questions as well as in developing theoretical and conceptual frameworks (Cronin et al., 2008). In contrast, the systematic literature review undertakes a more rigorous approach to reviewing the literature and is often used to answer highly structured and specific research questions. Systematic reviews on institutional support for teaching practices of academic staff are scarce. Most reviews conducted in recent years have focused on teachers' pedagogical beliefs and technology use in education (Tondeur et al., 2017), digital teaching competence of university teachers (Esteve-Mon et al., 2020), or the roles and development needs of teachers to promote creativity (Davis et al., 2014), to cite a few.

1.1. Keywords: systematic reviews, institutional support, teaching practices, higher education

2. Reasons/ arguments/ motivation for doing the project

Systematic reviews have become increasingly important in education, however, systematic review studies that explore institutional support of higher education (HE) teaching and learning practices do not abound. This research project aims to fill in this gap by conducting three systematic reviews that will throw light on on how HE institutes have provided "support" to the academic staff as well as students during the last decade on three particular areas, each of them responding to the following research questions:

- How do HE institutions support instructional practices of academic staff through the use of technology?

- How do HE institutions support internationalisation of the curriculum and internationalisation at home (IaH) practices?
- How do HE institutions support students' learning through the use of technology?

3. Design of research

3.1. Scope

The project will focus on describing and analysing the latest developments in terms of institutional support provided to the academic staff in their teaching practices and students in their learning process. Particular attention will be devoted to the identification and collection of effective and less effective practices that have been put in place by higher education institutions. More specifically, the project will be split into three working packages (WPs) with the aim of conducting three systematics reviews of recent research on: (WP1) HE institutional support to academic staff in the use technology-enhanced teaching practices, (WP2) HE institutional support of internationalisation of the curriculum and IaH practices, and (WP3) HE institutions support of student learning through the use of technology.

3.2. Objectives

- To review and advance scientific knowledge on the three main topics of the three WPs.
- To stimulate more extensive and collaborative research on institutional support for HE teaching practices.
- To enhance researchers' awareness of the importance of looking for complementary findings across disciplines and countries.
- To facilitate systematic exchange of ideas and develop research agendas on the three main topics of the research project.
- To translate research findings into recommendations for practice.
- To promote changes that will result in the development and improvement of the teaching and learning experiences in HE.
- To present the research results to the Eut+ community as well as the international scientific community.

3.3. Methodology

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The methodology employed for this project will be in line to the processes involved for systematic literature reviews, which involved three phases (Xiao & Watson, 2019):

1. Planning the review: (1.1) formulating the problem, (1.2) developing and validating the review protocol
2. Conducting the review: (2.1) searching the literature, (2.2) setting criteria for inclusion/exclusion, (2.3) conducting quality assessment, (2.4) extracting the data, (2.5) analysing and synthesing of data.
3. Reporting the review: the PRISMA flow diagram (Moher et al. 2009) will be adopted to report all findings.

The type of systematic reviews that will be conducted will be chosen according to the elements that will best answer the research question of each WP. This will include hybrid reviews which are a combination of descriptive reviews (textual narrative synthesis, scoping review), test reviews (meta-analysis), and extend reviews (thematic synthesis, meta-interpretation), and include both quantitative and qualitative methods (Dixon-Woods et al., 2005; Gates, 2002; Okoli, & Schabram, 2010; Pawson et al., 2005; Suri & Clarke, 2009).

3.4. Period of time: five years (2023 – 2027)

	2023	*2024*		*2025*	*2026*	*2027*
WP1: Systematic Review 1						
WP2: Systematic Review 2						
WP3: Systematic Review 3						

3.5. Partners

- CUT
- TUS

- UTCluj

4. Outputs and Outcomes

- Publications in high impact journals
- Reports
- Conference presentations

5. Impact of the project

The knowledge generated in this project will be particularly relevant for the EUt+ academic community, the international academic community, stakeholders who are involved in developing strategies to support teaching and learning practices, students, and generally anyone involved in Higher Education. The results will be translated into tangible recommendations aimed at helping both educators in their teaching activities and students in their learning process, as well as policy makers and other organisations dealing with didactics and pedagogy. Furthermore, these recommendations will seek to improve the connection between researchers and practitioners. In a similar vein, stakeholders will benefit from the scientific results of the project they were previously unaware of. As a long-term consequence, it could lead to the inclusion of variables that are of importance for both stakeholders and scholars.

6. Future directions

Ultimately, the project aims to lay the foundation for a long-term scientific and societal impact, by summarising established and identifying new cutting-edge topics, by stimulating and generating further innovative research lines, and by establishing research communities, as well as science and daily practice.

7. Funding and resources

	Systematic Review 1	Systematic Review 2	Systematic Review 3
7.1 Personnel cost	20 000	20 000	20 000
7.2 Equipment:			

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• Access to academic material: Databases/ articles, etc.	1000	1000	1000
• Tools for qualitative (and quantitative?) data analysis	1000	1000	1000
• Computers, Communication platforms, etc.	5000	5000	5000
7.3 Dissemination	5000	5000	5000
TOTAL	**32000**	**32000**	**32000**

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A3.2. Transformative digital pedagogy – ERASMUS funded project

A3.3. Identify pedagogical practices in EUt+

A3.4. Identify Phd candidates needs

A3.5. Analyse the date from teachers and students protocol and develop futures actions

Teacher protocol Summer School 2022 outcome

ELaRA Summer School

Education and Technology

27,28,29 September 2022

Troyes, France

Protocol panel 1

Teacher panel *Pedagogy & Technology* - All Partners

This document will form the basis of a panel discussion at our meeting in Troyes.

Please fill in the form below in short bullet points or relevant words under these headings :

Your personal story:

- Give us a few words on your Personal experience/story & why you became involved in education
- Some examples of what you believe are good teaching practices/have worked well for you in your teaching
- If you had a magic wand and could change one thing in your work what would it be

What does the following mean to you:

- Pedagogy
- Technology in Education
- Efficiency and Efficacy in education
- Transdisciplinarity

The Future

- What differences have you noticed since you started teaching
- How you believe your teaching could evolve over the next 5-10 years

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Students protocol Summer School 2022 outcome

ELaRA Summer School

Education and Technology

27,28,29, September 2022

Troyes, France

Protocol panel 2

Student Panel *Envisioning the Future of Education* - All Partners

This document will form the basis of a panel discussion at our meeting in Troyes.

Please fill in the form below in short bullet points or relevant words under these headings :

Your personal story:

- How did you find the transition to University from school
- What do you hope to gain from your time in University

Your time in University:

- What is your best learning moment in University
- What has been the least successful from a learning point of view
- What are the main challenges you face in University

The Future

- When you think of your future career how can the University help you get there /continue to support you

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Foreword to Section 3.4.2c

The Summer School in Sozopol explored the theme of Circular Pedagogy and was held in hybrid format. The delegates were drawn from all EUt+ members and consisted of a series of online and in person presentations with Q & A sessions running in the hybrid format. The student voice featured throughout the presentations with invited PhD students giving presentations on their experiences on their learning journey.

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Introduction

gave a summary of the EUt+ project and the long-term goals and provided an update of the timelines for the next phases of the project. This set the stage for the days of deliberations as we plan what the next steps will be and reflect on the team's achievements to date.

The first day was divided into a presentation on the work completed: the mapping survey of pedagogical knowledge, the initial research complied by the group with the alliance - with a successful Erasmus+ project under way and proposal for the future, this was followed by a short synopsis of the publications which are at white paper (complied and awaiting publication) and those that are in the early stage of development along with the description of the chapters in a proposed upcoming book. This led to the presentation on the theme for the four-day summit- Circular Pedagogy.

1.Circular Pedagogy

1.1 Rationale

This theme of *Circular Pedagogy* has emerged from our work as a team around pedagogy. It is formulated based on personal experience across the members of the team from different contexts, from research both conducted at an individual and collective level, and from interactions with external stakeholders both at national level and global (such as *Unitar*).

We began on this journey two years ago with a critique of *Traditional Pedagogy,* by which we mean the passing of knowledge from the lecturer to be passively accepted by students. It can lead education into a place where it only becomes relevant to itself, the students work towards goals they do not fully comprehend and the tutors and staff mould students in their own likeness.

This model comes from a different era (as illustrated by one of the students at the morning session) and is being strained when up against societal and global issues. The rise of new technology, societal pressures – such as climate change, generational changes have all placed the here-to accepted methods of education under scrutiny.

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This is further compounded by the economic pressure on Universities to justify their existence with product and results. This, in the name of efficiency, often leads to a segregation not only of knowledge into their disciplines but also a separation of areas of study with clear distinctions between roles of teacher, student and researcher.

1.2. Mini manifesto

What if we reconsider the three elements of research, teaching and learning not as separate entities but rather as a continuous circle of interaction?

What of instead of delivering facts?

We will together co-create a new body of knowledge.

One that allows external community groups and other discipline experts into a learning process.

One where students roles are not just passive recipients of knowledge but active participants where they engage in peer to peer learning and use critical judgement to make decisions.

This will allow an interchanging of roles where knowledge is co-created through each of the participants in the education process the researcher, the teacher and the student at times occupying each of these roles.

What each brings to the table are different experiences, levels or skills and in the process new knowledge is co-created.

In order to achieve this in a meaningful way the education process needs to change. The curriculum content needs to embrace critical thinking to support good judgement, the educators need to change their roles to act as facilitators and provide effective and timely feedback in the learning process.

Rather than a passive student learning journey this becomes more a journey of self-discovery and development of resilience and intrinsic motivation.

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A connected, orchestrated network where the University forms a partnership with relevant stakeholders and delivers on *People First.*

1.3. Action

Questioning active research

The presentation of joint work with a Students learning with Communities in Brazil illustrated the importance of carefully considered research understanding a sensitive context to situate a relevant research question as well as producing memorable art work produced by children.

The presentations by the PhD students discussed their experiences as researchers and teachers. Each spoke about how both in their own learning and those of their students that the need for an education rooted in *relational knowledge* is a key ingredient to future education models.

Students' voice

The presentations by the PhD students discussed their experiences as researchers and teachers. Each spoke about how both in their own learning and those of their students that the need for an education rooted in *relational knowledge* is a key ingredient to future education models.

They were very supportive of the earlier presentations on Circular Pedagogy and believed that this provides a template for student engagement and success for the future. They discussed the issue of resistance, both to challenging existing roles in traditional education methods which, although flawed, are familiar and easily understood. They illustrated through their own research how providing students with a supportive environment, one that acknowledges the individuality of the student and provides them with an opportunity to learn can provide for a more agile University and a deeper level of learning. The presentations were future orientated in terms of what education can become.

Lifelong learning

Continuing on the theme of future education the day concluded with a presentation on Chat GPT and AI in the education process. The presentation described the situation as it is at present and described the possible future scenarios.

This followed on from the earlier theme of the role in education in society, the new technology not only raises questions about academic integrity but perhaps more profound questions on the nature of knowledge and the role of University in society. It brought the day back full circle to a discussion on the reason for education which is less about providing certain answers but rather more about asking the right question.

Lifelong learning

The themes of structure and agency emerged in several papers presented. The new pedagogical model challenges the existing hegemony in the classroom by beginning with the student's experience as the starting point for learning. This was evident in the presentations that explored learning across borders. The *Internationalisation at Home* programme tackled how students could engage in the international experience without the issue of affordability being a barrier.

The Virtual world and how technology can be used to support students to learn a new language was highlighted as a study. The case study of learning through games demonstrated how both primary learning i.e. a new language and tertiary learning i.e. navigation of new technology is possible simultaneously. The technology was used an enabler for students to be more free in their learning to experiment in language without being self-conscious and also at the same time using a gaming technology that the students are familiar with.

Digital world

The pandemic and its after effects on the students and staff working methods formed a basis for an analysis of the very nature of education. The decisions around what remained and why was

described. This was placed in a context of changes to critical thinking, self-directed learning in an online world.

This folded into the discussion on the funded Erasmus+ project which is exploring how to prepare a self-assessment framework for tutors to encompass change and measurable achievements in digital pedagogy. This has led into a conversation about peer to peer learning amongst the academic staff across all the EUt+ partners via a series of focus groups. The EUt+ project allows not only for a sharing of knowledge and teaching practice but also an opportunity to engage in peer to peer learning and reflection.

Barriers

The interchangeable role of the lecturer in the Circular Pedagogy model requires self-reflection on the part of the educator in this process. The role requires a shift back to that of researcher to deal with student 'bottlenecks' in their learning journey. This allows the lecturer to place

themselves into the learning perspective of the student. The example presented was exploring how to fly a plane. In this we can see these 'bottlenecks' as a positive – a learning opportunity, rather than a barrier to learning.

The 'bottlenecks' can initially be seen as specific to a discipline (such as the plane) but from the interactive exercise it is clear that they are common issues that students and staff face together regardless of discipline or country. When we think of 'bottlenecks', negative connotations come to mind, but as the presentation illustrated they are part of the learning process – the students gain agency in their learning and the staff have an opportunity for reflective learning and peer feedback. This challenges the expert in teaching to place themselves in the role of the student, be they a novice or a PhD student to facilitate the learning.

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Placing Oneself in the Learning Process

This led to a discussion on the role of being aware of one's own place in the learning process as a lecturer and to comprehend where the student is placed. The presentations also reflected back on the importance of transdisciplinarity in the education that is more comprehensive and applying a systemic framework. This includes for example the use of games in the learning process to highlight a cultural awareness of different languages.

In the example the 'game jam' approach uses transdisciplinarity to set the learning outcomes for the language learning programme. This in turn requires planning and consideration of the methods to be set out in advance. It nonetheless had a huge element of fun in the examples shown with knowledge from gaming being folded into learning languages. The discussion both in the room and online highlighted student autonomy in this approach.

Embracing failure

It was established that intrinsically motivated, self-directed learners who are engaged in reflective learning is the goal. So how is this achieved? Through space for making mistakes was the consensus of the room and online discussion that followed. It is through the making of mistakes that students can learn on a deeper level. The process becomes central to part of the

learning in the Circular Pedagogy approach. This allows students to lead (with tutor support) which scaffolds the learning and enables the students to challenge themselves. As part of the challenge learning from failure is part of the essential learning journey.

By exploring the idea of play and (serious) play we can take a world that the students are familiar with and build the learning on that. This draws the students into the learning as opposed to feeling that they are forced on take on a persona. This changes the role of the educator to becoming a moderator, one that supports the 'play' and the play is an active role for the student.

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Conclusions and next steps

Conclusions

The Summer School led to the identification of the key elements of how Circular Pedagogy theory could be applied in practice.

Students who are:

- Intrinsically motivated learners
- Reflective
- Critical Thinkers

The learning space will be:

- Digitally supported with technology being used to enhance teaching and learning.

The learning will be:

- Cross Disciplinary

The teaching and learning will be:

- Student centred
- Authentic assessment driven

Next steps

Based on this Summer School and the previous deliverables : General installation layout, Summer School 2021 – Post pandemic pedagogies, and Summer School 2022 – Pedagogy between tradition and innovation, next steps will be:

1. *Innovation and digitalization in pedagogy* - workshop in 49th International Conference "Applications of Mathematics in Engineering and Economics" (AMEE) 2023. The AMEE is indexed in SCOPUS, world's largest abstract and citation database of peer-reviewed research literature with Scientific Journal Rankings (SJR factor).
2. Collaboration with Columbia University

Co-funded by the European Union