

Student Involvement in Interdisciplinary and Transdisciplinary Research

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Academic Tradition and New Challenges



- **Founded by the Republic of Slovenia on 29th January 2003**
- **Third Slovenian University**
- **Its name “Primorska” is the name of the region where it is located (the Littoral region of Slovenia)**
- **Operates between the borders of Italy and Croatia in an officially bilingual region (Slovene, Italian)**
- **Located in Slovenia’s most ethnically and culturally diverse region**



University of Primorska

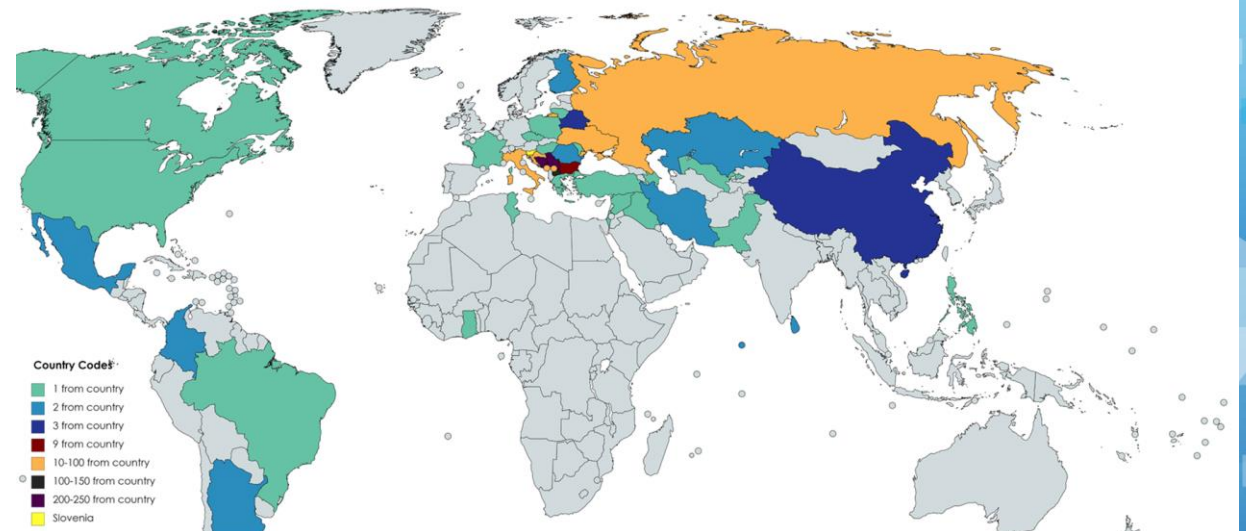
Enrollment (academic year 2021/22)

- Number of accredited study programmes: 94 (15 taught in English)
- Number of students: 5,805
- Undergraduate: 4,277
- Graduate: 1,528 (1,321 masters and 207 PhD)

17.5% International Students



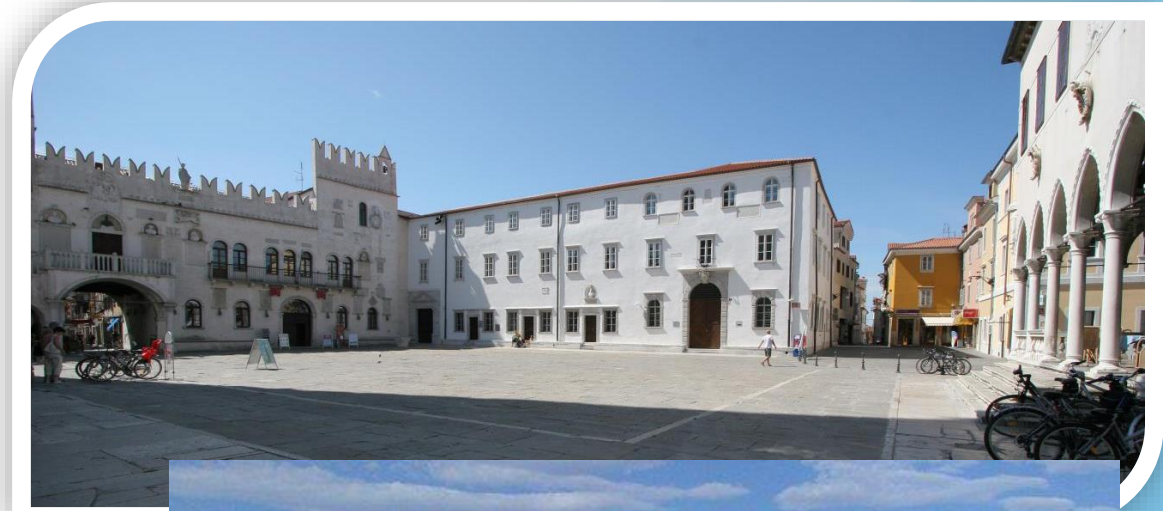
1,016 International Students from over 45 Countries



Faculties at the University of Primorska



- **Six Faculties:**
- **Faculty of Humanities**
- **Faculty of Management**
- **Faculty of Mathematics, Natural Sciences and Information Technologies**
- **Faculty of Education**
- **Faculty of Tourism Studies – Turistica**
- **Faculty of Health Sciences**



Study PROGRAMMES IN ENGLISH

(academic year 2021/22)

Bachelor:

- Management
- Mathematics
- Computer Science
- Bioinformatics
- Tourism Enterprise Management



Master:

- Economics and Finance
- Mathematical Sciences
- Sustainable Built Environments
- Data Science

Doctoral:

- Mathematical Sciences
- Computer Science
- Renewable Materials for Healthy Built Environments

Options for student enrollment for inter- and transdisciplinary research programs/degrees

- **Student enrolls in a degree program with two or more academic departments with supervisors (co) from each discipline**
- **Student conducts research as part of an interdisciplinary laboratory and enrolls in single-discipline program**
- **Student enrolls in a traditional program conducting independent research that crosses disciplinary boundaries**
- **Student receives funding from an interdisciplinary research initiative and has an interdisciplinary focus**

“interdisciplinary PhD as a programme where students work with academic staff, curricula, or research topics in ways that include more than one academic field, within a single department or across multiple departments”

Student research within interdisciplinary and transdisciplinary focus requires some adaption to the normal quality assessment of traditional graduate degrees

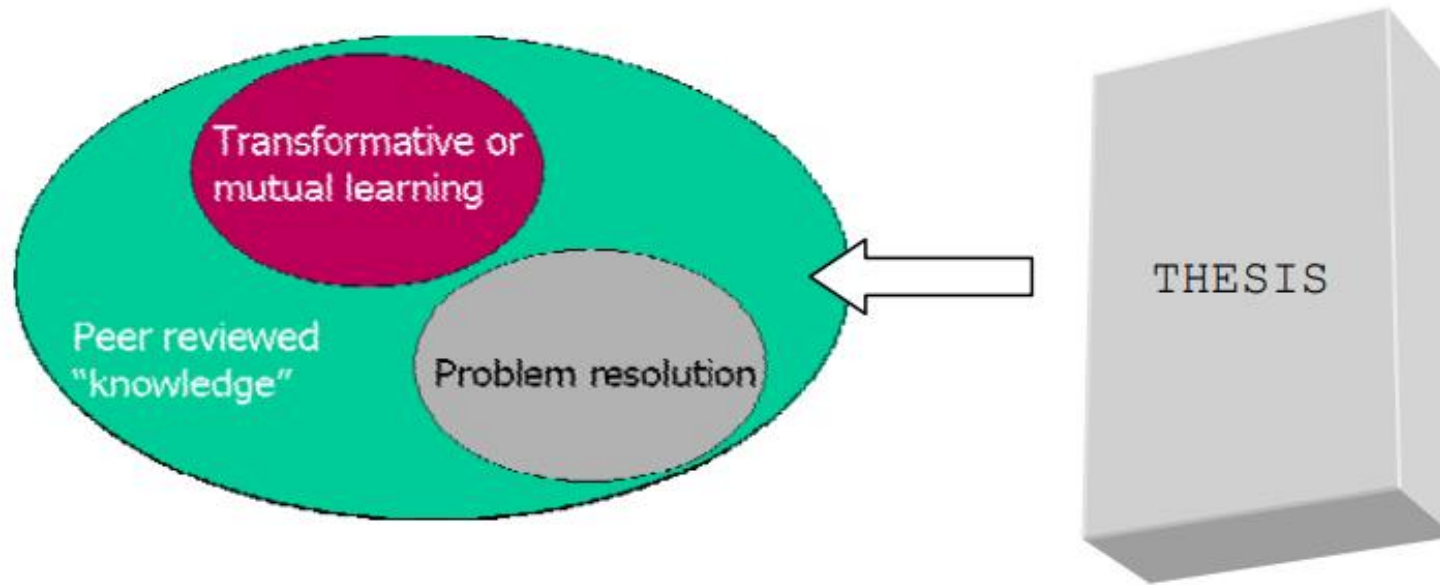


Figure 1: Relationships between the three outcome spaces in an ID or TD thesis.

Table 1: Interpretation of criteria for ID and TD research and suggested modified forms of these criteria.

Criteria based on the literature on doctoral-ness and examiners views	Key points about what it means for ID and TD research	Modified form of criteria (closer to how it might be appropriately interpreted for ID and TD research)
Substantial contribution to knowledge	<ul style="list-style-type: none"> • ‘knowledge’ needs to be interpreted broadly • contributions toward, or impact of the research context, situation, area of work and practice need to be included (which relates to socially robust knowledge in the problem space) • the adjective ‘substantial’ may be misleading, more important that the student articulate the nature of the contribution and its significance 	Original and creative contribution to knowledge and/or practice
Well designed and coherent argument	<ul style="list-style-type: none"> • critical criterion for ID and TD research for demonstrating validity of the research and providing strong synthesis across diverse areas • requires an authentic voice of the researcher to come through • may include aware [in]coherence for dealing with paradoxes likely to arise in ID and TD research 	Critically aware, coherent argument

Table 1: Interpretation of criteria for ID and TD research and suggested modified forms of these criteria.

Criteria based on the literature on doctoral-ness and examiners views	Key points about what it means for ID and TD research	Modified form of criteria (closer to how it might be appropriately interpreted for ID and TD research)
Grasp of theoretical perspectives or grasp of methodology	<ul style="list-style-type: none"> • requires evolving development of a methodology to align with the underlying theoretical perspective and methods used • requires a critical understanding of methodologies from different fields to enable a student to justify research design choices. 	Alignment between epistemology, theory, methodology, claims, and enquiry space
Mastery of topic	<ul style="list-style-type: none"> • challenging and potentially impossible with respect to the topic • mastery in the approach taken, or through influence and application are more relevant and important 	Mastery of the process and/or outcomes
Effective and well-finished presentation	<ul style="list-style-type: none"> • requires use of multiple languages and effective approaches to communicate across disciplines 	Effective communication for diverse audiences

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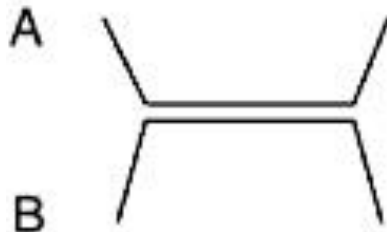
Table 15.1 Student socialization in disciplinary and inter/trans-disciplinary doctoral programs

	Traditional disciplinary-based doctoral programs	Inter/trans-disciplinary doctoral programs
Formal curriculum	Limited coursework typically based on disciplinary foundation	Limited coursework that includes content from constituent fields
Faculty	Apprentice model; relationship with individual faculty advisor	Community model; relationships with faculty and scholars from multiple disciplines and institutions
Peers	In same degree program with limited connections across campus and possible connections in professional associations	In interdisciplinary program while also from representative disciplinary programs
Professional associations	Typically those associated with primary faculty advisor	Potentially wide-ranging, including those associated with interdisciplinary topic and constituent fields

Ref: Weidman, J. C., & DeAngelo, L. (Eds.). (2020). *Socialization in higher education and the early career: Theory, research and application*. Springer.

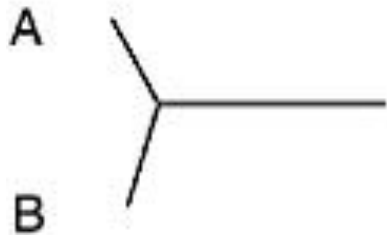
Interdisciplinary Research Structure

Interdisciplinary scientific research goes beyond multidisciplinary research where one shares an established procedure with researchers in another field



A *Multidisciplinary:*
Join together to
work on common problem,
split apart unchanged
when work is done.

B



C *Interdisciplinary:*
Join together to
work on common question or problem.
Interaction may forge a new
research field or discipline.

Options for student enrollment for inter- and transdisciplinary research programs/degrees

- Student enrolls in a degree program with two or more academic departments: supervisors (co) from each of disciplines
- **Student conducts research as part of an interdisciplinary laboratory and enrolls in single-discipline program**
- Student enrolls in a traditional program conducting independent research that crosses disciplinary boundaries
- **Student receives funding from an interdisciplinary research initiative and has an interdisciplinary focus**
 - ❖ **Example: PhD Student enrolled in Renewable Materials for Healthy Built Environments at UP and performing research on a interdisciplinary research project at InnoRenew CoE**





InnoRenew CoE – private not-for-profit research institute based in Izola, Slovenia



The **InnoRenew CoE**:

- Founded 15 Feb. 2017 by:



Zavod za varstvo
kulturne dediščine Slovenije
Institute for the Protection of
Cultural Heritage of Slovenia



ZAVOD ZA
GRADNENIŠTVO
SLOVENIJE
SLOVENIAN
NATIONAL BUILDING
AND CIVIL ENGINEERING
INSTITUTE

The **InnoRenew Project**:

- H2020 Teaming Project
- 5-year duration (extended 1.5 years)
- EU & National funding (45 million euro)
- 9 Slovenian partners
- 1 German partner (Fraunhofer – WKI)
- April 2017 – September 2023
- Coordinated by University of Primorska

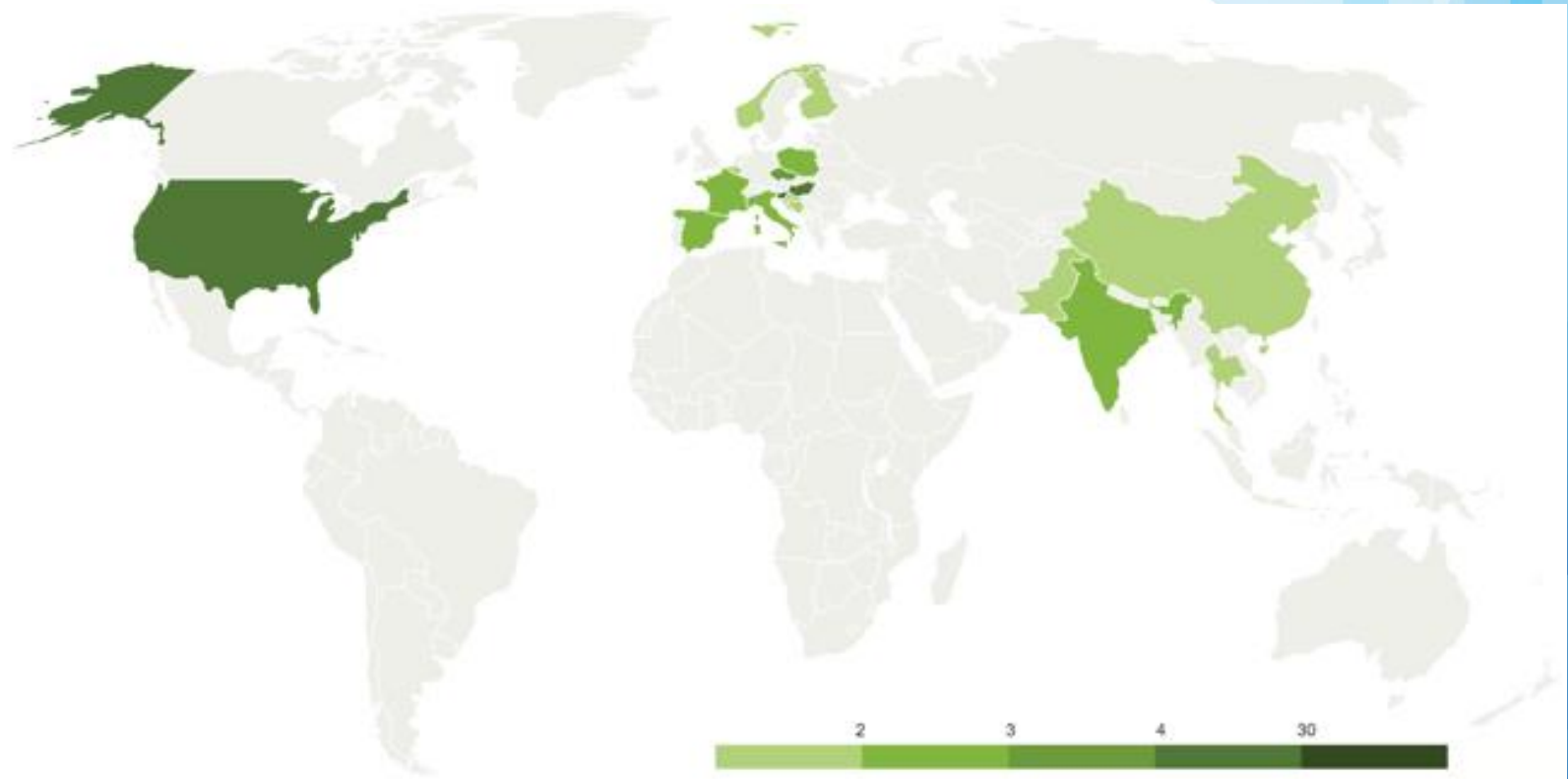
Over 40 currently running projects and over 400 international researcher partnerships



InnoRenew CoE has an international, interdisciplinary outlook with researchers from around the world

InnoRenew CoE researchers are experts in a wide variety of fields:

- Wood science
- Material science
- Engineering
- Architecture
- Computer science
- Mathematics
- Psychology
- Kinesiology
- Social science
- Chemistry ...)

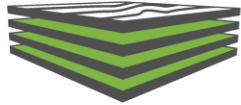


Example: The structure of InnoRenew CoE is well positioned to advance interdisciplinary student research

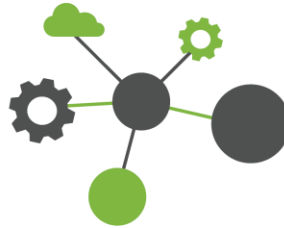
Human Health



RM Composites



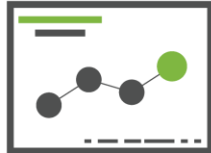
ICT for Wood & Buildings



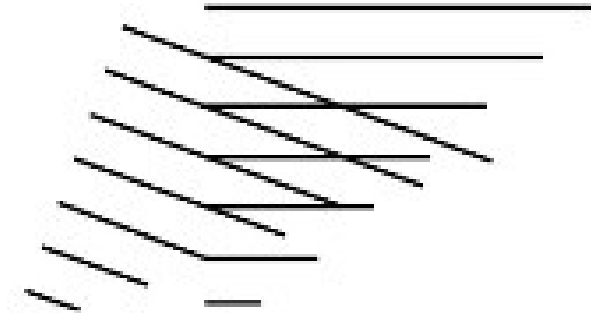
Wood Modification



Data Science



Sustainable Building



How do we integrate these together to answer a question, develop a new field of research, or setup interdisciplinary research?

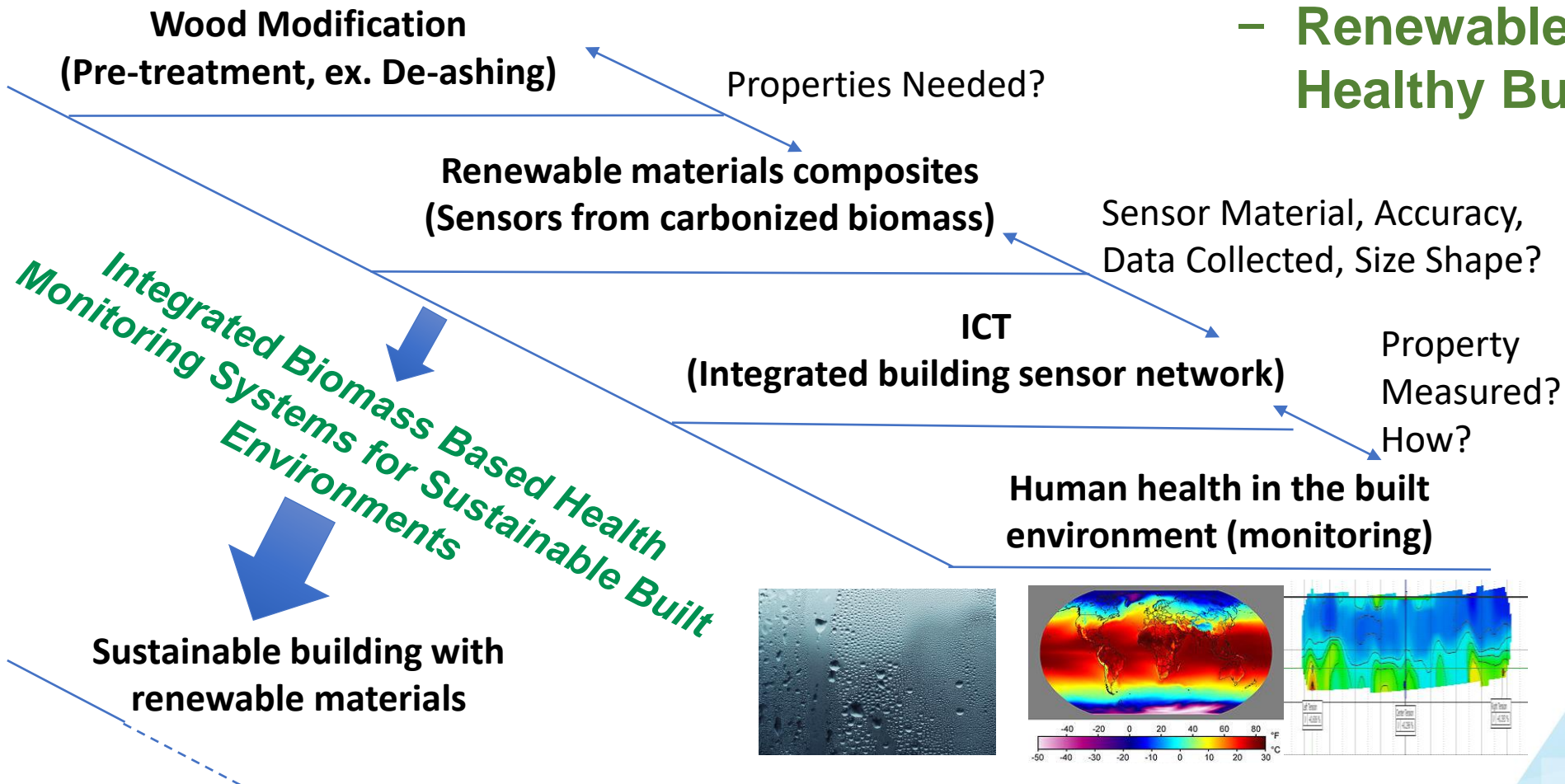
Example: Interdisciplinary Research PhD Structure



IR Research: Building system sensor networks

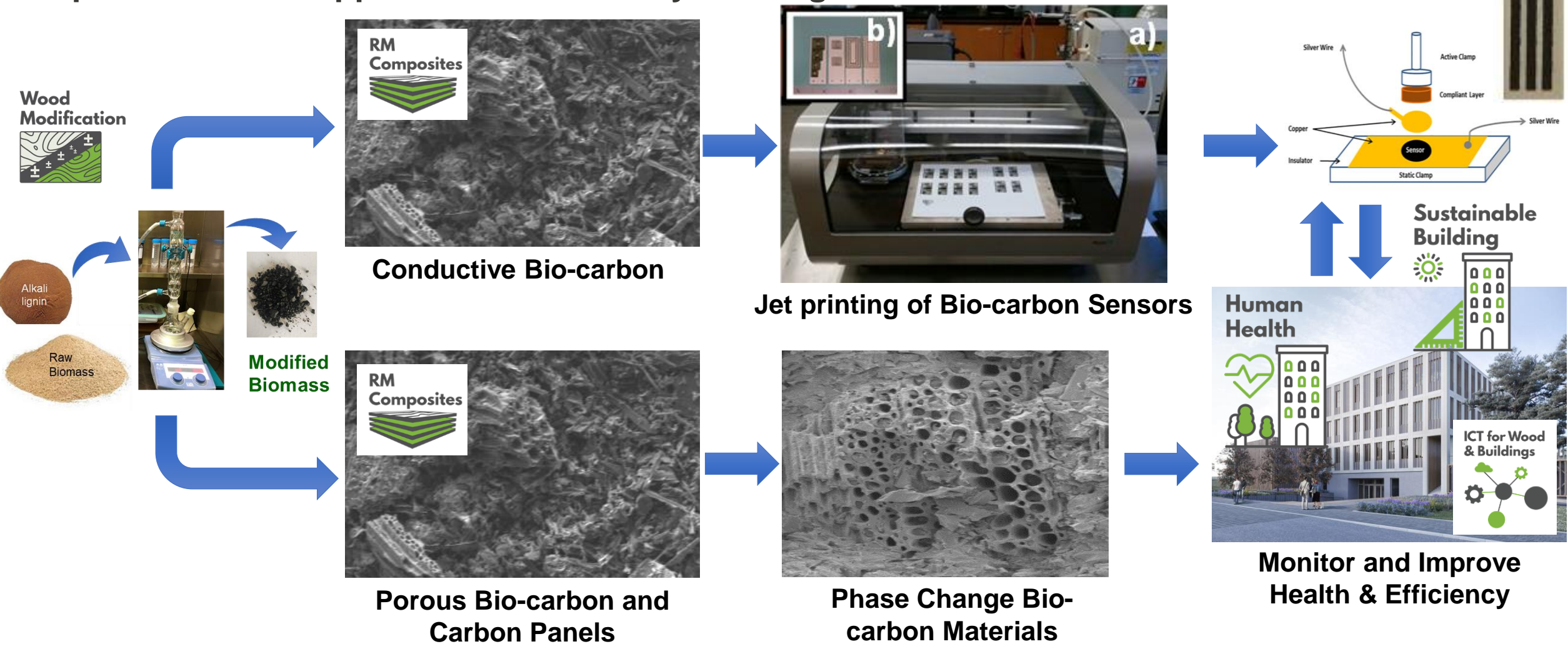
Doctoral:

- **Mathematical Sciences**
- **Computer Science**
- **Renewable Materials for Healthy Built Environments**



Example PhD Interdisciplinary Research

Interdisciplinary research on activating biomass for advanced sensor and composite material applications for healthy buildings



Challenges/Opportunities of Interdisciplinary Student Research

- **Shift in curriculum offering for more diverse subjects**
- **Need for different communication skills**
- **Inclusion of students in larger international projects**
- **New degree programs of interdisciplinary nature**
- **Inclusion of more societal impacts in experimental design**
- **Changes in assessment criteria of performance and research output**
 - **Are students in interdisciplinary research assessed differently?**
- **How do students gain the necessary skills to understand other disciplines?**
- **Is mastery of every discipline in the research necessary?**
- **Can we shift perceptions or thinking about other disciplines?**
- **Who is the primary supervisor?**
- **Is publishing students work more problematic in focused high impact journals?**
- **Others?**



EDUCATION

SCIENCE

ODLIČNOST

IZOBRAŽEV

EDUCATION

ODLIČNOST

EXCELLENCE

Thank You For Your Attention!

www.upr.si

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