5. Toolkit module: Students co-researching and undertaking scholarship projects with staff

5.1. Overview

Research and scholarship projects are one of the main activities of the university staff. Students' participation in this process on an equal basis is the topic of the toolkit.

5.2. Objectives

This toolkit aims to present tips and advice for organising processes where students are co-researching and undertaking scholarship projects with staff. The purpose of this material is to empower students as participants in these processes.

5.3. The analysis of workshop conclusions

The following issues were discussed during the "Workshop for modular training toolkit for students engaged in ENHANCE activities" organised at the Warsaw University of Technology on 5th November 2021.

5.3.1. Encouraging students

When discussing the issue of encouraging students to co-research and undertake scholarship projects with staff, the following questions should be addressed.

- What are the potential **incentives** for a student to participate in the co-creation activities?
- How to **encourage** students to participate in co-creating university activities?
- What can **discourage** students from participating in the co-creation process?

The participants of the workshop pointed out to a few crucial issues. The suggested topics of research and scholarship projects should be in line with current trends, market demands, and social challenges. Students in cooperation with research staff should also be given freedom to define or specify generally identified research challenges. Thanks to the fact that students have the opportunity to participate in research, learn about the ways, challenges and the methods of conducting it, it is probable that they will start doctoral studies. The proposed project subjects can also be addressed to students in the above manner.

All methods of informing the scientific, student and industry community by students - co-creators of the results obtained should be promoted by proposing and financing participation in conferences, seminars and publication of articles.

Students participating in research devote their time to conducting it and thanks to this involvement they gain valuable skills and knowledge. If the university allows it, their work can be rewarded with an appropriate number of credits (for example ECTS). Awarding credits can also be approached systemically and included in the degree programme requirements. It is also possible to propose a relevant microcredential offered by the ENHANCE consortium.

5.3.2. Costs and benefits

To address the problem of costs and benefits of the processes of co-researching and undertaking scholarship with students and employees, the following questions should be addressed:

- **Do we need** co-creation at a university?
- What are the **costs** (not necessarily financial) of co-creation?
- What are the **benefits** (for whom) of co-creation?

The cost of involving students in collaborative research includes additional time spent on recruiting, introducing, and supervising new members of a research team. If this process is well and efficiently organized, then the cost (in terms of the time spent) is outweighed by its outcomes. Therefore, it is

important to have know-how, good practices, or effective processes of acquiring students or matching students and researchers.

A big challenge is the lack of systematized and shared knowledge about what research teams are currently working on or planning. In order to encourage students to participate in research, they should be involved in applied research. The emphasis should be put on sharing the knowledge about ongoing and planned research. Students should be encouraged to conduct research in interdisciplinary, intercultural and international teams. Such teams should be more open due to their diversity and different points of view. For students participating in research, this is a valuable experience that will be useful in their later careers.

5.3.3. The organisation of the co-creation process

Analysing the organisation of co-researching and undertaking scholarship the following question is to be answered.

- How to organise the co-creation process to engage a small selection of participants and /or the whole community?

The problem that has been identified is the large number of students in relation to the number of research teams that could efficiently engage students to collaborate. On the other hand, a small number of students is relatively easy to get involved.

The challenge will be to match (even in terms of interests) students and research teams properly. A recommended solution will be the use of IT tools (e.g. social media such as Facebook, Instagram). However, it should be remembered that in addition to the fact that such platforms are being used, they should be supplemented with appropriate content by research teams wishing to involve students in research.

The habits related to the tools used for everyday communication may be a certain barrier in this process. While researchers most frequently use email, students prefer other methods (messenger, WhatsApp).

5.4. Examples

The following examples of co-researching and undertaking scholarship with students and employees (not necessarily carried out correctly) at different universities are presented below.

5.4.1. X-tutorials: Research tutorials by students for students, TUB

The Berlin University Alliance promotes student-based research tutorials for students keen to do research and who want to experiment, develop, analyse, research or evaluate a topic in a self-organized project together with other students. With the X-Tutorials the Alliance is supporting students with a particular interest in research and in doing so is strengthening the link between research and teaching.

X-Tutorials are research tutorials that run over the course of one or two semesters. They are initiated by students and carried out by them independently. Together with other students, they conduct research in student teams on a topic of their interest. Of course, cooperation can be organized with other institutions in the Berlin area, for example with social actors (non-governmental organizations (NGOs), museums, associations, political organizations) or with other research institutions.

5.4.2. X-Student Research Groups, TUB

Research teams made up of junior researchers and students. With the X-Student Research Groups the Berlin University Alliance is supporting research teams made up of junior researchers and students. The aim is to involve students in current research projects of partner institutions and enable them to participate in top-level research at an early stage of their studies.

The X-Student Research Groups are organized in the form of research seminars and usually run over the course of a semester. This gives junior researchers the opportunity to transfer their own research into teaching and to gather the initial experience in managing research groups.

The Berlin University Alliance sponsors up to 32 X-Student Research Groups every year. Junior researchers can apply for funding twice a year as part of the “Call for Proposals”.

5.4.3. Research Project, WUT

The course entitled "Research Project" is an interesting example of such a co-creation. This course is dedicated to the students of Intelligent Systems specialization in the field of Computer Science (master’s degree). Students learn how to conduct scientific research in the context of developing, testing and implementing broadly understood intelligent systems. It is assumed that students join research and develop existing project at WUT, or they can formulate their own theses and research them. Students work in small teams (2-3 people) under the supervision of a teacher. The project will result in a research paper, a conference submission together with a poster, or a report (or its part), ready for publication.

According to both the people responsible for running the Research Project course and the University authorities involving students in scientific research can contribute to strengthening the potential of research projects conducted by teams from the Warsaw University of Technology.

For students, it is a valuable experience as it prepares them well for both research work (at a university, research institute, R&D department of a company, etc.) and for their master's projects. At the same time for research teams, it is an opportunity to strengthen the team and to look at the process of solving a problem from a different perspective.

The expected thematic scope of research carried out by students may relate to various research issues, although the extracted research task should include a component related to broadly understood intelligent systems. It needs to be highlighted that interdisciplinary projects are welcomed. The examples of this type of projects include models supporting renewable energy installations, the optimization of transport services in Smart City, and the analysis of the spread of COVID-19.

5.5. Suggested scenario

The scenario of a **single workshop** of a course like Research Project described above is presented.

5.5.1. Overview

This material presents the scenario of a single workshop in a course related to conducting research by teams of students (like Research Project described above). It is assumed that the course consists of a project part and a workshop part. During a project part students work independently and during a workshop part students meet with their tutor and discuss progress.

5.5.2. Objectives

The objective of the workshop is to discuss the current state of the research projects carried out by students. At the same time the aim is to introduce some aspects of knowledge related to the research process and to the specific topic of the research.

5.5.3. Target participants

- Students organised into teams.
- The teacher who conducts classes and moderates the discussion.
- The group tutor (not necessarily the same person as the teacher) who proposes a general research topic and supports the research.

5.5.4. Format

The single workshop is divided into five parts. The workshop timeframe is approximate.

- Discussion of the progress made by the research groups (ca. 25 minutes).

- A short theoretical introduction done by the teacher (e.g. a review of research methods) (ca. 20 minutes)
- Work in groups on the selection and clarification of research methods (ca. 20 minutes)
- Sharing results and discussion (ca. 15 minutes)
- Wrap-up and homework assignment (ca. 10 minutes)

5.5.5. Duration

90 minutes

5.5.6. Resources

Markers, post-its

5.5.7. Description

Each meeting has the following goals: checking the students' progress in the conducted research, providing them with the methodological knowledge regarding the current stage of research (e.g. conducting relevant literature studies, proper formulation of research hypotheses, their verification, planning the experiment, selection of appropriate research tools, research synthesis, writing an article) and discussing the problems they encountered and searching for solutions together.