

Reproducible Research: Advancing Innovation Through Connectivity

Website: <http://reproducibleresearchinr.rbind.io/>

Country: Serbia

Geographical focus: Serbia, Western Balkans

Scientific field/Thematic focus: Cross-thematic/Interdisciplinary, General

What is the good practice about?

This project provides an overall introduction to Reproducible Research (RR) This is be done through the online platform with openly shared content, and through practical workshops introducing the ideas of transparent and reproducible research that foster the principles of Open Science, Science Communication, Ethics and Inclusion: <http://reproducibleresearchinr.rbind.io>.

Looking at the research findings without being able to run computational experiments to probe the results presented, effectively limits the scope for understanding the magnitude of the available knowledge within scientific studies. Allowing others to replicate, test, reuse, extend and build on published research results can accelerate the rate at which scientific development drives cultural and technical innovation. In view of this, the presentation of the available code, data and algorithms should be available to scrutiny and possible connectivity to wider research projects.

The RR platform provides a framework that foster and routinise the emerging research practices. The existing platform can be developed further to combine fully all materials necessary for establishing understanding and applying RR practices within scientific research communities. Those openly-available teaching/learning material serve not just to facilitate training of the researchers, but also to fostering of an active, inclusive, diverse community of learners and instructors that promotes and models the importance of reproducible research.

Researchers are able to request workshops on reproducible research practice, informing and teaching others, therefore broadening the network of accessible resources. Additionally, users can create and organise their own workshops, widening the scope and potential of the platform to business, community and civic stakeholders. The existing website can be developed further to include and provide opportunities to disseminate individual and institutional research. By providing a range of scientific and cultural online sharing modules, actors are enabled to identify specific areas of research pertaining to their areas of interest.

Why is this initiative needed?

It can be argued that many higher education institutions in many aspects are slow to make changes in their approach to pedagogy and research methodologies. Whilst there are many reasons for this, the outcome is the same, graduates are not aware of the advantages of reproducible research (RR). This is certainly the case in the Western Balkan region and through experience we also understand that a



significant number of teaching faculties do not appear to be aware of RR as an entity. We have delivered a considerable number of workshops to a diverse range of students and disciplines on the subject of RR. We believe there is a huge opportunity to further develop existing platform and network that create learning communities that are open to academic institutions, but most importantly to wider communities. Our principal aim is to build the bridges spanning the gaps between community, technology, business and education and in the process develop collaboration and connectivity.

In short, reproducibility is the ability to reconstruct a result/finding using datasets and data analysis, which is essential in scientific research. Though scientific disciplines are the obvious beneficiaries of RR, we see the potential for widening this approach to a more diverse range of subjects and actors.

At present within scientific communities' tools are being developed that enable scientists to share research materials, data and computational analysis. Despite this practice, many of these tools are underused due in large part to:

- ⇒ researchers being unaware of their existence, or
- ⇒ simply don't understand how to apply them to their daily workflows.

Integrating such tools into regular practice is beneficial in regards to practical applications, but additionally is valuable in creating and establishing transparent research materials. Open source research material significantly increases the reach of their potential impact. Expanding the reach of teaching materials for example, can pronouncedly accelerate the adoption of best practices. The relatively few bodies that offer tutorials and seminars pertaining to RR have their strengths, however none of them at present offer scalable solutions to what is a considerable gap in the training of RR.

The current limited state of being is a fundamental motivating factor in the further development of this platform proposal. Nevertheless, we are well aware that in order to realise its broader possibilities we need to establish a culture of knowledge sharing and as such our proposal is aimed at planting the seed and nurturing its growth.

What are the main objectives and activities?

The aim of this project is to establish an open access, fully transparent research resource that can be accessed by a diverse range of actors, ranging from business, NGO's, civic authorities and communities. This RR platform can act as a foundation for future development in the form of education and training programmes with regional actors.

It can facilitate the culture of learning communities at a regional level. Learning communities offer the potential to establish a unity between a diverse range of groups and institutions, playing a part in promoting societal change. This initiative by its nature is a collaborative event unrestricted by geographical boundaries. Partnerships between public and private, industry and communities are formative in building collaboration and shaping a communal approach to regional empowerment.

The project is fully sustainable, inclusive and create greater connectivity among involved WB regional stakeholders and beyond through knowledge share and feedback loops.



This project can be developed further to involve research network-community building. The central component of this intended network would be the RR platform, which can act as a source spring for future developments. The RR platform is already comprised of all materials necessary for establishing understanding and applying RR practices within scientific research communities and can be developed further. Through the delivery of workshops that directly utilise the platform and the development of teaching materials, it can help deliver tutorials and seminars on themes such as Open Science and Ethics in Research, tools for RR, RR principles and practice and research communication. The programme can be delivered in person, online or as collaborative hybrid events covering the Western Balkan region.

Who is involved?

Research presents many opportunities for regional universities and their communities to learn together. Regional universities bring a research capacity to their home locations that is rarely available through other mechanisms in the region.

The RR platform provides opportunities to disseminate individual and institutional research and as such it is relevant to a diverse range of actors, ranging from local universities and business, NGO's, civic authorities and wider communities. By providing a range of scientific and cultural online sharing modules, actors are able to identify specific areas of research pertaining to their areas of interest.

Researchers are able to request workshops on reproducible research practice, informing and teaching others, therefore broadening the network of accessible resources. Additionally, users can create and organise their own workshops, widening the scope and potential of the platform to business, community and civic stakeholders.

REPRODUCIBLE REASERCH IN R

Tatjana Kecojevic, SisterAnalyst



Can this good practice be replicated?

The project will ensure its impact continuity through the empowerment of selected researchers to understand what RR is and to train them to use specific tools for making their research reproducible, and by equipping them with educative material for teaching RR to their students and colleagues. Although we are focused on research and work with several universities from the region (The University of Belgrade, Belgrade Open School, The University of Novi Sad, Social Fabrics Research Lab at West University of Timisoara, The University of Tirana, The University of Shkodra) the focus will be also to attract research



centres and other interested stakeholders from industry and civil sector to take part in this mission and to continue to commit in this direction. As a partner organisation of the Regional Network of Women in STEM in the WB, a joint initiative of the Regional Cooperation Council and UNDP the project can seek additional support. We will work closely with universities in developing the RR platform with necessary tool to be included relevant to their curriculum and research thus ensuring its sustainability after the project's implementation.

This project will pay particular attention to dissemination strategy by concentrating on communication of project activities and results, promotion and awareness raising of RR for regional cooperation, capitalisation on experience and knowledge sharing to target groups and relevant stakeholders. The project communication will have two pillars: 1) Internal communication objectives: to ensure open, clear, timely, and transparent communication among project partners and the donor; 2) External communication objectives: to raise awareness about the project objectives among a range of stakeholders; to inform at an ongoing base about project activities; to inform, raise awareness and increase knowledge of a range of stakeholders about project outputs and their use; to encourage actions and attitude change of a range of stakeholders as a result of achieved project outputs.

The project will adhere to the principles of transparency, reproducibility and knowledge sharing, all materials produced by the project as knowledge outputs will be open access and promoted to a wide variety of stakeholders. The project will work in synergy with universities, research centres, think tanks, NGOs, business and networks such as the Regional Network of Women in STEM set up by RCC and UNDP, the South East European Digital Rights Network and the Western Balkans European Social Survey Network. This will help to multiply the effect of the project results and serve to broaden the reach of the project.

More information about the necessary resources is available and contacts with the project promoters can be established in case of interest!

Further links:

- ⇒ <http://reproducibleresearchinr.rbind.io/>
- ⇒ <https://www.facebook.com/events/1540710839456135/>
- ⇒ http://rifdt.instifdt.bg.ac.rs/bitstream/id/6295/bitstream_6295.pdf

Relevant RRI keys: Ethics (in R&I), Public Engagement (for R&I), Science Education, Open Access/Open Science/Open Data, RRI Governance

Type of practice: Websites serving as platform for services to clients, Promotion of partnering opportunities, Organisation of info days, workshop, seminars, etc.; Organisation of training, webinars; Organisation of conferences, panels, round-tables; Organisation of matchmaking and networking (tools, events, other support); Peer learning / mentoring



Target groups: researchers (starting from PhD-candidates, on the individual level), universities, research performing organisations; research and innovation funding organisations; innovators in the business sector; students (up to Master level); research administration; think tanks, business, NGOs, civic authorities and communities

