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Evaluation of value creation in bioinformatics MOOC

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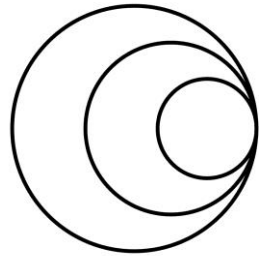
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October 2022

Collaborative research



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Background

WCS aims to provide **learning, training and engagement** with a mission to enable the wider public to explore genomic science and its impact on research, health and society.



Background

As part of WCS online offering, we developed **'Bioinformatics for Biologists' MOOC**, providing flexible, open training for skills in high demand, and delivered it on FutureLearn, a social-learning platform.

The course was on an introductory level and covered **basics of using Linux command line, Bash scripting and Plotting in R for biologists.**

We developed a **framework for evaluating the impact of this course in terms of creating value for participants, their organizations and networks.** We evaluated the first of the four runs that the course had.

Bioinformatics for Biologists: An Introduction to Linux, Bash Scripting, and R

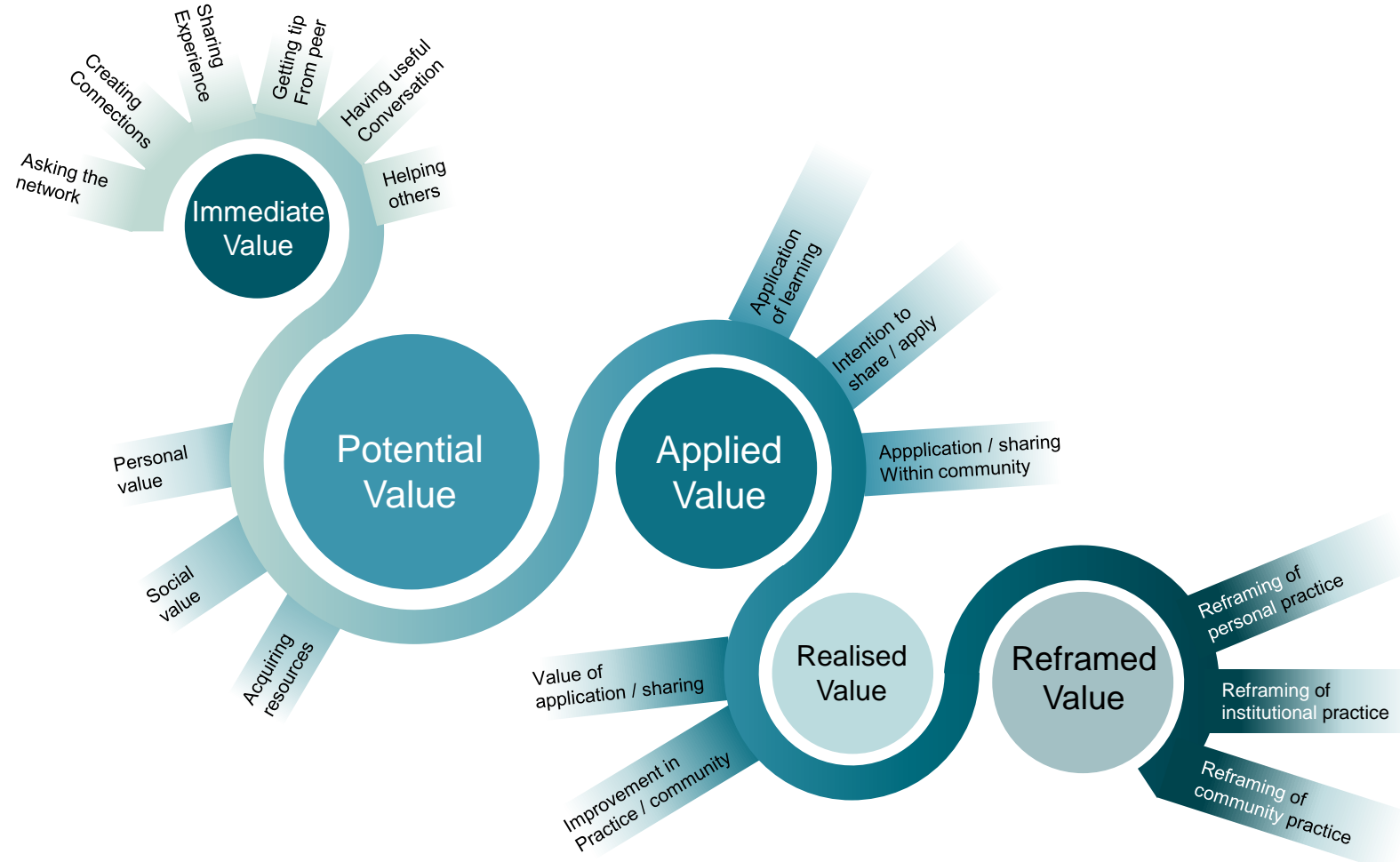


Value Creation Framework in networked communities of practice

- **Communities of practice:** “learning partnership among people who find it useful to learn from and with each other about a particular domain. They use each other’s experience of practice as a learning resource. And they join forces in making sense of and addressing challenges they face individually or collectively.”
- **Networks:** “They use their connections and relationships as a resource in order to quickly solve problems, share knowledge, and make further connections.” The networks can be technology mediated or not.
- **MOOC** as a network of a large group of participants learning together on a platform supportive of social learning, so lots of peer-learning takes place

Reference: Wenger, E., Trayner, B., Laat, M., (2011) Promoting and Assessing Value Creation in Communities and Networks: A Conceptual Framework. Available at https://www.researchgate.net/publication/220040553_Promoting_and_Assessing_Value_Creation_in_Communities_and_Networks_A_Conceptual_Framework

Cycles of Value Creation



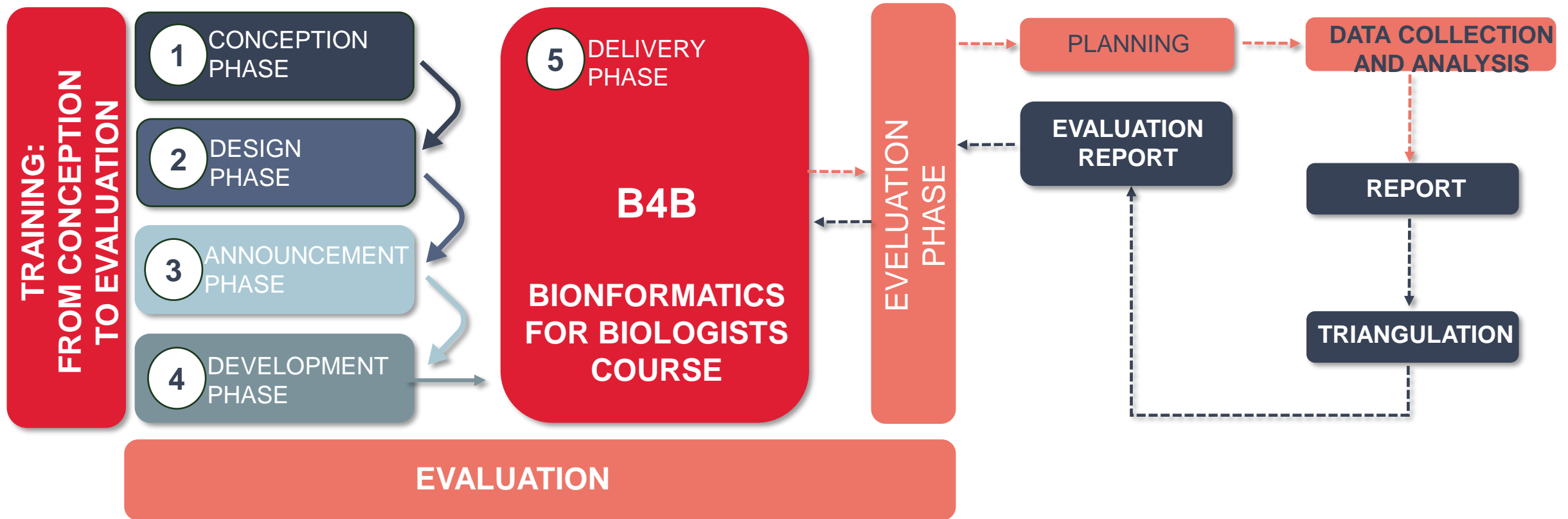
Cycles of Value Creation

Overarching question explored the ways and the extent to which the course influenced learners' practice and/or careers, propagated to the local communities and contributed to the changes in participants' workplaces.

Cycles of value creation	Learning, application of learning and changes in practice	Research questions included
Immediate value	Through engagement on the course	How engaged learners are in the course? How are learners interacting? What barriers to learning they experience?
Potential value	Knowledge capital	Which potential values learners experience during the course: personal, social, acquiring resources
Applied value	Use and application	How are the learners applying learning during the course? Are they intending to apply or share the learning after the course? Have the learners applied or shared the course learning and resources in their practice or community?
Realized value	Improvement as a result of application	What is the value of application or sharing in practice/community?
Reframing value	Transformation or big changes	In what ways has course reframed personal, institutional/community practice? What significant changes has sharing/teaching others brought to community?

Methods

The evaluation was carefully planned and **integrated** with the **course design, development and delivery**, followed by a **post-course survey**.



Methods

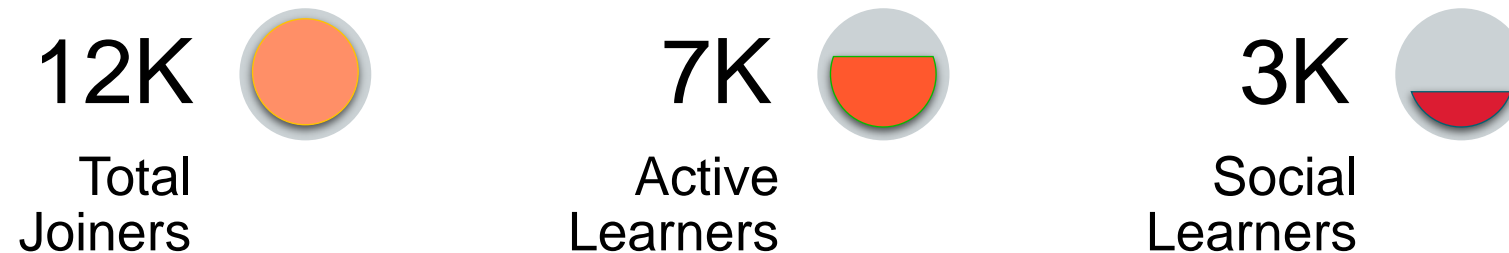
All research questions were linked to different **indicators and data collection sources**.

We analysed the data using a mixed-methods approach. Data sources included FL platform analytics, comments and discussions by learners during the course, participant observation notes, and answers to the 6 months follow-up survey.

“By itself one indicator is merely suggestive and one story is anecdotal, but the cumulative effect of a set of indicators with a collection of related corroborating stories starts to provide robust evidence.”
(Wenger et al)

Results

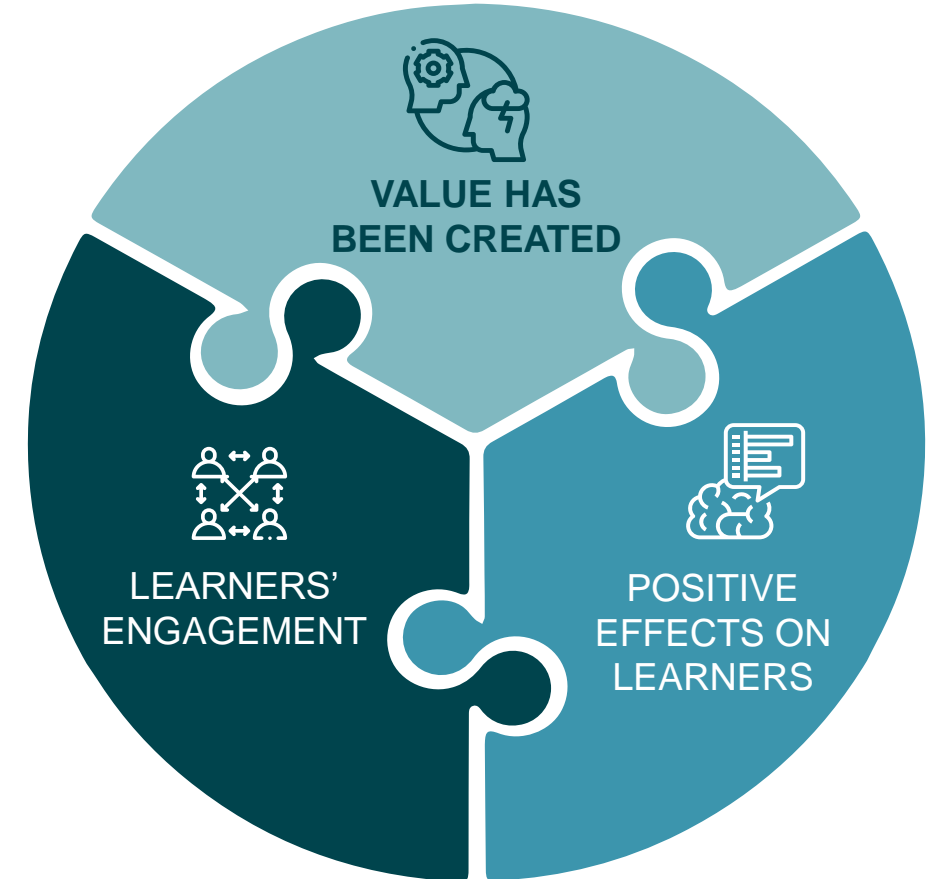
- The course had **~12K total joiners** and **~7K active learners**, with **social learners (posting at least a comment) comprising nearly 3K**.
- The community of international learners came from more than **150 different countries**.



Results

The evaluation clearly showed that :

- **Value had been created** within the networked community of practice on this course.
- **Learners' engagement** in the course activities lead to creation of 'knowledge capital' to be applied and realized after the course.
- **The post-course survey confirmed positive effects on learners** who wanted to share their personal stories about the impact, including transformational value, of the course on their study, work, career, organizations and communities.
- **Some obstacles to learning were also detected**, the most common being technical, due to platform characteristics, level of the material presented and the language barrier.

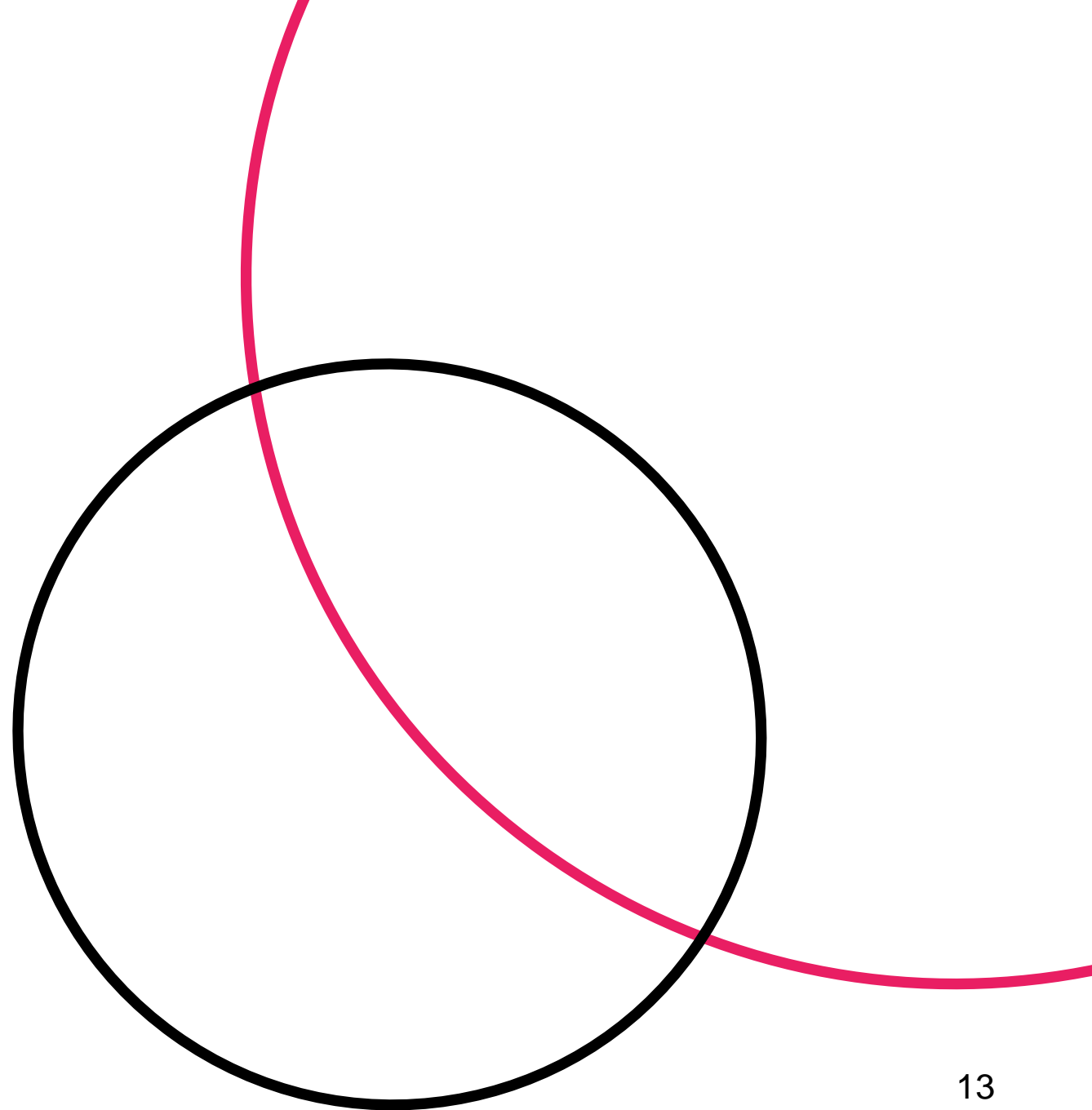


Conclusions

- The awareness of **evaluation objectives, planning and embedding** of the evaluation **from the early course-concept stage, positively influenced course design and the overall process of development and delivery**, yielding tangible positive impact on learners' practice and careers.
- This **adapted evaluation framework can be used to evaluate impact of a MOOC on learners and their networks**, throughout the different cycles of value creation. It can also be further considered as a model for a comprehensive impact evaluation of other types of networked communities of practice, especially the technology mediated ones.

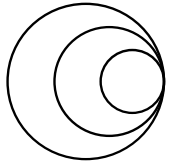
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May 2021