

Researching X-professional Collaborations through Co-design and Co-creation

Mapping An Emerging Field

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Abstract- This article reviews and maps the literature on how co-creation and co-design have been used in relation to research on interprofessional collaborations in education and in practice. Through a review of the 105 research articles, we find that both co-creation and co-design have mattered more recently, both as methodological approaches and to describe aspects of interprofessional collaboration. Researchers attuned to working directly with practitioners to solve pressing societal issues increasingly use co-design and co-creation for this purpose.

Keywords- co-creation; co-design; interprofessional collaboration; mapping literature review.

I. INTRODUCTION

Interprofessional collaborations are needed to develop solutions for many current problems in society. Often problems that can be characterized as being "wicked" [1]-[3] requiring ongoing collaboration between disciplines and professions to provide sustainable solutions.

Wicked problems, including conflict and sustainability, that transcend the resources for any single disciplinary or even traditional interdisciplinary approach for solution have become primary sources of material for contemporary transdisciplinary work. [3, p. 9]

Methods, tools, and techniques to address wicked problems have been developed in the design fields, popularized by the spread and use of "design thinking" [1][4] One such flavor of design thinking is co-design, a practice focusing on involving various stakeholders in envisioning and creating solutions that address complex problems. While co-design practices are often object oriented, aiming to provide products, services and systems, the more general practice of co-creation can have broader aims, focusing for instance on collaboration, and to innovate and transform future practices.

In our case, we aim to shed light on the conditions for cross-sectorial collaborations between schools and cultural institutions in Norway. We undertake a research project aiming to bridge existing contradictions within the cultural schoolbag—an ongoing program designed to grant students access to cultural expressions within educational settings. Specifically, we explore how student teachers can transform into agents of change by facilitating connections between schools and the cultural sector as part of their teacher training. The backdrop for our investigation lies in the asymmetric

power relations between schools and cultural institutions within the cultural schoolbag [5]-[8] where teachers view themselves as having limited influence in TCS activities they facilitate for [5][9] and lack a clear understanding of their role [10]. Our project seeks to empower these educators through co-design and co-creation activities, equipping them with the knowledge and tools to navigate this complex landscape. In organizing the co-creation activities, we have sought to provide support and scaffolding for new collaborative practices to emerge – to be able to understand the socio-material conditions for such practices to be made more likely and durable. We have been guided by the ideal captured by the concept of “transformative mutuality” which Eyal & Yarm [11, p. 680] describe as collaborations,

...characterized by both parties taking an active approach, engaging willingly and enthusiastically in shared educational deliberation, and devising and implementing educational activities that have a synergistic effect, contributing to the growth of both parties on an individual and organizational level, as well as to the students. [11, p. 680]

To support an investigation of the potential of co-design and co-creation activities to shed light on the conditions for establishing sustainable transprofessional practices in cross-sectorial collaborations, we have performed a mapping literature review to ground further studies. Before describing the methods followed in Section III, the mapping in Section IV and its implications for our research in Sections V and VI, we will provide definitions of the key concepts used in our search, co-design, co-creation and cross-, multi-, inter-, and trans-professionality in Section II.

II. CONCEPTS

A. cross-, multi-, inter-, and trans-professionality

The distinctions between cross-, multi-, inter-, and trans-professionality closely follow the distinctions between cross-, multi-, inter-, and trans-disciplinarity. According to Mahler et al. [12] the difference between a discipline and profession is that a discipline seeks to develop theory to understand the world, while a profession is a practically applied discipline. For both disciplines and professions, the prescripts cross-, multi-, inter- and trans denote the degree of collaboration in a x-disciplinary or x-professional team as categorized in Table I.

TABLE I. DEGREE OF COLLABORATION IN X-DISCIPLINARY TEAMS.

Prescript	Collaboration
Intra	Mono
Multi	Alongside
Cross	Alongside and informing each other
Inter	Partially overlapping
Trans	Almost fully overlapping

The knowledge about the nature and utility of x-professional collaboration so far relies heavily on the mostly programmatic research on x-disciplinarity. The origins, development and current issues of transdisciplinarity have been presented by Bernstein [3]. In the following, we therefore ground our search concepts on Choi and Pak’s [13] thorough review of the differences in the definitions of multidisciplinary, interdisciplinarity and transdisciplinarity in the literature from 1982 to 2006. They distinguish between multi-, inter-, and transdisciplinarity this way:

Multidisciplinary, being the most basic level of involvement, refers to different (hence "multi") disciplines that are working on a problem in parallel or sequentially, and without challenging their disciplinary boundaries. Interdisciplinary brings about the reciprocal interaction between (hence "inter") disciplines, necessitating a blurring of disciplinary boundaries, in order to generate new common methodologies, perspectives, knowledge, or even new disciplines. Transdisciplinary involves scientists from different disciplines as well as nonscientists and other stakeholders and, through role release and role expansion, transcends (hence "trans") the disciplinary boundaries to look at the dynamics of whole systems in a holistic way.[13, p. 359].

In summary, they define multidisciplinary as additive (2+2=4), interdisciplinarity as interactive (2+2=5) and transdisciplinarity as holistic (2+2=yellow). They denote the output of transdisciplinarity as yellow to signify that transdisciplinary collaborations have to potential to make contributions that can’t be traced directly to the individual contributions made by disciplines being involved. Figure 1 depicts a common graphic to explain the differences between the x-disciplinaritys.

B. Co-design and co-creation

Sanders and Stappers [14] provide much cited definitions for co-creation and co-design. According to their perspective, co-creation encompasses “any act of collective creativity, i.e., creativity that is shared by two or more people.” [14, p. 6] They further relate co-design to co-creation, asserting that co-design is a specific instance of co-creation. In essence, Sanders and Stappers [14] co-design represents a subset of the broader concept of co-creation. Mattelmäki and Visser [15] offer an alternative perspective. They view co-creation as a “creative moment” or “method” within the co-design process. We believe these problems with mapping the relationship between co-creation and co-design signifies that the phenomena the concepts seek to describe are on the same level – it is equally sensible to write that co-creation activities relies on co-design or that co-design activities rely on co-creation. We have recently clarified this by understanding co-design and co-creation as related but different practices, involving many of the same practitioners, but with differing goals and rationales –

design being mostly object oriented and co-creation being mostly process oriented.

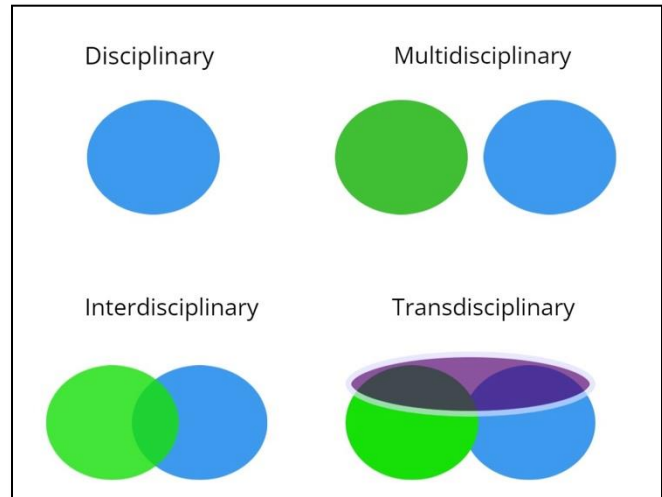


Figure 1: Based on graphic from Holistic Education Network (no longer available online).

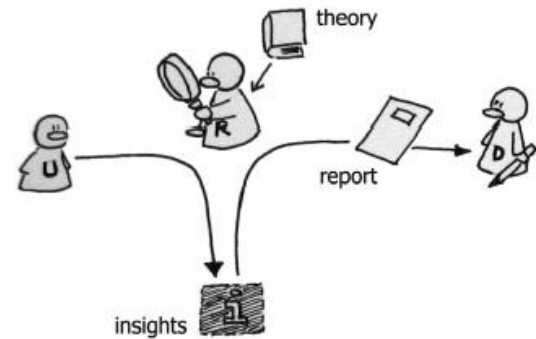


Figure 2. Pre-planned and designer/researcher-led activities to study users for insights informing the design of something. Image from Sanders and Stappers [14, p.11].

For our purposes here, we follow Sanders and Stappers [14] in that co-creation emphasize the importance of participation and creativity in co-design processes. How co-creation signifies how all stakeholders should be involved in design, and where the designers need to take on new roles to facilitate for this.

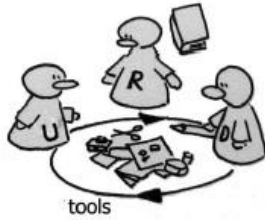


Figure 3. Designers, researchers and stakeholders co-creating insights together using fitting representational tools. Image from Sanders and Stappers [14, p.11].

Co-creation inspires a move from pre-planned and designer-led activities where design researchers study users for insights informing the design of something, to a model where the designers and stakeholders co-create insights together using fitting representational tools. Figures 2 and 3 show how the two collaborative models are depicted in Sanders and Stappers [14]

III. METHODOLOGY

The targeted scope [16] of the mapping literature review was research using co-design or co-creation to enhance x-professional collaborations in problem solving. In addition, we used English and scientific peer-reviewed articles published in electronic databases without a year limit, as inclusion criteria (cf. [17]). Table I summarizes the five criteria of inclusion used for this mapping. An important clarification is that for inclusion, articles must employ or investigate co-design or co-creation as a means, i.e., as an action or intervention, not solely as, for example, “co-creation of knowledge”, where the output stems from any kind of dialogue or activity. Furthermore, the study must aim to describe and develop an understanding of what supports x-professional collaborations (or cross-, multi-, trans-), where it is not merely one finding among several.

TABLE II. CRITERIA OF INCLUSION

No.	Criterion type	Description
1	Topic	Research using co-design or co-creation to enhance interprofessional collaborations in problem solving.
2	Date	No limit
3	Language	English
4	Type of paper	Scientific peer-reviewed articles
5	Source	Electronic databases

Four searches were conducted in discipline-specific bibliographic databases: Web of Science, Scopus, Eric (Education Resources Information Center), and ACM Digital Library in March 2024. ACM is the largest collection of literature in computer science, information technology, and telecommunications. We made this decision to include studies emphasizing interprofessional collaboration drawing upon methodologies from the design fields, which we considered

relevant to our research aims. Each search undertaken, utilized either the term co-creation or co-design, along with one of the four terms cross-, multi-, inter-, trans-professional, to identify relevant studies. In the searches we used Boolean operator “OR” to combine the terms within each concept, and “AND” to combine the different concepts (cf. [17, p. 109] as follows:

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co-creation
OR
co-design

AND

cross-professional
OR
multi-professional
OR
inter-professional
OR
trans-professional
    
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Based on the search, a total of 148 references were considered potentially relevant and consequently listed in a spreadsheet. The articles were then independently coded by the two first authors using the codes co-x (covering the terms co-design and co-creation) and x-professional (for the terms cross-, multi-, inter-, trans-professional). To identify whether the study uses, for instance, co-x as a method or if the researcher(s) addresses co-x as a phenomenon, each axis was further divided into two aspects, resulting in four codes: co-x method, co-x phenomenon, x-prof method, and x-prof phenomenon. The first author coded the articles based on the abstract, while the second author reviewed the full articles.

The outcome of the coding was that 29 studies were immediately excluded because they were coded only on either the co-x axis or the x-prof axis by both coders. Out of the remaining articles (119), the first and second authors coded differently on one or more of the four codes in 35 of the studies. After a brief screening, we found that nine of these could be excluded because, despite different coding, they were not coded along both axes of co-x and x-professional. Subsequently, we were left with 26 studies that the first and second authors reviewed and coded together, ultimately agreeing upon a final coding. As a result of this process, an additional five articles were excluded because they were not coded along both axes. In summary, out of the 148 studies, we were left with 105 articles that met all inclusion criteria.

The final step in the coding involved identifying the sector addressed in the studies—whether it pertained to health, education, or other domains—and categorizing the research into vocational research and educational research.

IV. FINDINGS

A. The relationship between co-x and x-professional

The first group of articles in Table III (Group 1) [18]-[49] uses variants of both co-x and x-professional only as descriptive, analytical concepts – as is common in the social sciences. Four groups (Groups 2, 3, 4 and 6) all use co-x as methodological approach, and in addition engaging x-

professionals in this. The difference between these groups is whether they also use the terms as analytical concepts:

- only to describe x-professionality (Group 2) [50]-[72]
- to describe both co-x and x-professionality (Group 3) [73]-[93]
- neither to describe co-x nor x-professionality (Group 4) [94]-[113]
- only to describe co-x (Group 6) [114][115]

Two small groups of articles (Groups 5 and 8), [116]-[119] use co-x as methodological approach but combined with x-professionality only as an analytical concept. A few articles (Groups 7 and 9) use x-professionality methodologically but combined co-x only as an analytical concept [120]-[122].

Overall, the main finding is that the studies reviewed in this article either use both concepts as a methodological approach (66) or purely analytically (32).

TABLE III. MAIN MAPPING.

	Group				Art#
	co-x		x-professionality		
	Meth.	Phen.	Meth.	Phen.	
1	n	y	n	y	32
2	y	n	y	y	23
3	y	y	y	y	21
4	y	n	y	n	20
5	y	n	n	y	3
6	y	y	y	n	2
7	n	y	y	y	2
8	y	y	n	y	1
9	n	y	y	n	1
				SUM	105

B. Field and type of research

In the coding of the 105 studies, it became evident that among the articles identified in this review, the majority are situated within the health sector (92 studies) (see Table IV).

TABLE IV. EDUCATION OR PROFESSIONAL PRACTICE.

Type	Sectors		
	Health	Edu.	Other
Vocational research	78	5	6
Educational research	14	1	1
Summary	92	6	7
In total			105

Looking at the type of research conducted within these studies, vocational research predominates, represented in 78 of the 92. These are studies that explore professional practices and how practitioners acquire knowledge and skills within health and care services, both in the private and public sectors. Out of the health studies, 14 constitute educational research, focusing on how higher education institutions prepare students for the workforce.

In the field of education, 6 in total, 5 are vocational research, while only one focuses on higher education. Additionally, 7 studies were identified in other sectors (cf. enterprise, management) of which 6 are vocational research.

Given these findings, it is evident that there is a dearth of research on x-professional collaborations through co-creation

in the educational sector both in the health and educational sector (and others, in the review). Specifically, how higher education institutions equip students for such collaborative efforts in their professional lives as educators. Bridging this research gap could lead to future studies aimed at enhancing pedagogical practice in higher education institutions, which in turn demand innovative approaches to curriculum design and development.

V. DISCUSSION

Most of the studies identified and mapped in this review use the term interprofessional (Table V). According to the distinctions between degrees of collaboration in x-disciplinary teams made by Choi and Pak [13] this signifies a high degree of collaboration between the professionals being studied, where the professionals actively engage with one another to provide better solutions (2+2=5). Very few studies use the term transprofessional, however.

TABLE V. THE USE OF INTER-, MULTI-, CROSS- AND TRANSPROFESSIONAL IN THE MAPPED STUDIES.

Search engine	Term	Occurrences
Web of Science	Inter	66
	Multi	13
	Cross	2
	Trans	0
Scopus	Inter	79
	Multi	19
	Cross	1
	Trans	1
Eric	Inter	9
	Multi	0
	Cross	0
	Trans	0
ACM	Inter	54
	Multi	6
	Cross	4
	Trans	1

There could be several reasons for little use of the term transprofessional in this literature. Many researchers will probably use transdisciplinary instead, or maybe it is because the precise meaning of transprofessional collaboration remains elusive, or maybe we don't need a category denoting an even higher degree of collaboration than interprofessional [13]. Regardless, the answer to these questions, our mapping indicates the need for more theory building and research to clearly delineate transprofessional- from other types x-professional collaborations – and further, into how such collaborations can inform research on what conditions sustainable practices involving multiple sectors, disciplines and / or professions.

VI. CONCLUSION AND FUTURE WORK

The literature mapping clearly indicates that more research is needed to provide more certainty in what transprofessional practice is. Providing such clarity will meet the increased demand to better understand and accommodate for inter-agency working often requested in public policies [123]. Hulme et al. [123] clarify the notion of transprofessionalism

as an "expanded professionalism" relying on common language and shared understandings with the potential to overcome professional and disciplinary boundaries. They seek "new forms of collaborative working and a commitment to the co-construction of knowledge" [123, p. 539] and work with operationalizing "collaborative practitioner enquiry" to "open up spaces that allow new transprofessional dialogues to develop." [123, p. 542] While Hulme et al. [123] frame practitioner inquiry as facilitating for third spaces, we look to co-design and participatory design to achieve the same goals. In participatory design there is a well-established discourse on how to facilitate for the emergence of a third space [124] more specifically and in line with Hulme et al. [123] of how to facilitate spaces for reciprocity and mutual learning [125]. Exploring such an agenda is in our valuable, and something we will pursue in our ongoing and future research projects.

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