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CO-VALUE — A CO-EVALUATION FRAMEWORK FOR PARTICIPATORY PROCESSES

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To my parents, that never gave up on me
To Florian, for always being there
To Luna (*in memoriam*), the goodest of girls

“...in order to do something big, to think globally and act globally, one starts with something small and one starts where it counts.”

Nabeel Hamdi

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RESUMO

A avaliação sempre provou ser uma parte valiosa das políticas, projetos e programas urbanos. Paralelamente, ao longo dos anos, o papel da participação também foi considerado de crescente importância. No entanto, embora a participação em planeamento urbano e desenho urbano tenha florescido para dar voz àqueles que foram historicamente privados de um, na sociedade de hoje, esses processos participativos são capazes de envolver diferentes entidades em resultados mais operacionais e socialmente responsáveis, bem como um sentido fortalecido de responsabilidade por parte de todos os atores. A co-avaliação é a junção da participação colaborativa e avaliação, representando uma potencial resposta ao fato de que indivíduos e comunidades se sentem cada vez mais capacitados para os resultados florescerem a partir da sua própria opinião e voz.

Assumindo que esses processos co-criativos têm um grande peso quando se trata de projetar espaços urbanos sustentáveis, úteis e inovadores, o objetivo principal desta pesquisa foi desenvolver uma estrutura conceitual de avaliação para processos de co-criação.

Partindo de uma revisão de literatura sobre participação e avaliação em planeamento e desenho urbano, a metodologia apresentada – *CO-VALUE* – propõe diversas etapas de co-avaliação a serem aplicadas às diferentes fases de um projeto co-criativo, bem como conjunto de critérios de avaliação para apoiar estas etapas.

Para avaliar sua validade conceitual, o *CO-VALUE* foi parcialmente aplicado num curso de verão, de design e construção na Chalmers University of Technology, através de diferentes formulários, workshops e registos diários.

Alguns problemas na combinação desta pesquisa com o projeto resultaram na ambiguidade de certas etapas da avaliação, que não foram totalmente integradas e consideradas na gestão do projeto. Concluiu-se que o processo de avaliação é uma parte intrínseca da gestão de projetos e não deve ser dissociado e implementado separadamente. Da mesma forma, o papel de um avaliador externo apresenta certos riscos para o processo de avaliação, uma vez que o distanciamento entre os participantes e o projeto pode influenciar as ferramentas aplicadas e os respetivos resultados de maneira adversa.

As etapas apresentadas nesta metodologia mostraram a possibilidade de variar no tempo, sendo que algumas delas podem ser realizadas de forma contínua. Os parâmetros de avaliação aplicados neste estudo piloto demonstram ser representativos dos princípios gerais de um processo participativo, embora sua relevância altere dependendo da fase e da etapa do projeto.

Mais estudos serão necessários para verificar a aplicação de uma metodologia de co-avaliação em diferentes contextos (como Portugal) e outros domínios e setores. Para melhor compreender o contexto de Portugal, seria relevante estudar o programa SAAL, bem como outras intervenções participativas urbanas contemporâneas – de modo a compreender como a co-avaliação as teria influenciado e como este tipo de metodologia abordaria problemas atuais como a gentrificação. Quanto à aplicabilidade noutros domínios e setores, seria apropriado estudar como os processos de co-avaliação levariam diferentes atores de diferentes setores e domínios a transcender as suas especialidades, a fim de combater silos e resolver problemas de forma mais eficaz e sustentável.

PALAVRAS-CHAVE: metodologia de co-avaliação, co-criação, participação em desenho urbano

ABSTRACT

Evaluation always proved to be a valuable part of urban policies, projects and programs. In parallel, through the years, the role of participation has also been deemed of rising importance. But though participation in urban planning and urban design flourished to give voice to those who have been historically deprived of one, in today's society, these participatory processes are capable to engage different stakeholders for more effective and socially responsible results, as well as a heightened sense of ownership felt by all actors. Co-evaluation is the embodiment of collaborative participation and evaluation, being a potential response to the fact that individuals and communities feel increasingly entitled to see results flourish from their own opinion and voice.

With the belief these co-creative processes have a great weight when it comes to designing sustainable, usable and resourceful urban spaces, the main goal of this research was to develop a conceptual methodology of evaluation for co-creation processes.

Stemming from a literature review on participation and evaluation in urban planning and urban design, the presented conceptual framework – CO:val – proposes varied stages of co-evaluation to be applied to the different phases of a co-creation project, as well as a set of evaluation criteria to support these stages.

In order to assess its conceptual validity, CO:val was partially applied in a project pertaining to a *design and build* summer course, in Chalmers University of Technology, through different surveys, workshops and daily logs.

Some problems in combining this research with the project have resulted in the ambiguity of certain stages of evaluation, which were not fully integrated and considered in the project management. It was concluded that the evaluation process is an intrinsic part of project management and should not be dissociated and implemented separately. Likewise, the role of an external evaluator presents certain risks to the evaluation process, since the distancing from the participants as well as the project can influence both the tools applied and the respective results in an adverse way.

The stages presented in the conceptual framework showed the possibility to vary in timing, while some can be carried out continuously. The evaluation parameters applied in this pilot study appeared to be representative of the general principles of a participatory process, although their relevance altered depending on the phase and stage of the project.

Further studies would be needed to verify the application of a co-evaluation framework in different contexts (such as Portugal) and other domains and sectors. To better understand the context of Portugal, it would be relevant to study the SAAL program as well as other contemporary urban participatory interventions – to understand how co-evaluation would have influenced them and how would it address current problems such as gentrification. As for the applicability in other domains and sectors, it would be appropriate to study how co-evaluation processes would prime different actors from different sectors and domain to transcend their corresponding fields of expertise, in order to fight silos, and address problems in a more effective and sustainable way.

KEYWORDS: co-evaluation framework, co-creation, participation in urban design

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	i
RESUMO	iii
ABSTRACT	v
1. INTRODUCTION	1
1.1. BACKGROUND.....	1
1.2. OBJECTIVES.....	1
1.3. DELIMITATION	2
1.4. RESEARCH QUESTIONS	3
1.5. METHOD	3
1.6. STRUCTURE	4
2. PARTICIPATION IN URBAN PLANNING, URBAN DESIGN AND EVALUATION	5
2.1. PARTICIPATION IN URBAN PLANNING.....	5
2.2. PARTICIPATION IN URBAN DESIGN	7
2.2.1. TRENDS IN PARTICIPATORY URBAN DESIGN	8
2.3. PARTICIPATION IN EVALUATION.....	9
2.3.1. EVALUATION IN PARTICIPATORY DESIGN	11
2.3.1.1. Classifying participatory design evaluation	11
2.3.1.2. Continuous evaluation in participatory design	13
2.4. SUMMARY.....	14
3. CO-VALUE, A CO-EVALUATION FRAMEWORK	17
3.1. PRINCIPLES	17
3.2. PHASES AND RESPECTIVE STAGES	18
3.2.1. CO-EVALUATION	19
3.2.2. CO-INITIATION.....	20
3.2.3. CO-PRODUCTION	22
3.2.4. CO-IMPLEMENTATION	22

3.2.5. CO-ACHIEVEMENT	22
3.2.6. CO-DELIVERING	23
3.3. EVALUATION CRITERIA.....	23
3.4. SUMMARY.....	25
4. PILOT STUDY	27
4.1. CASE DESCRIPTION	27
4.1.1. CONTEXT	27
4.1.1.1. Design and Planning for Social Inclusion.....	27
4.1.1.2. Dare to Build.....	31
4.1.1.3. Swedish Million Homes Programme	34
4.1.1.4. Built environment and land use.....	35
4.1.1.5. Socio-economic context	37
4.1.2. PROJECT DESCRIPTION.....	38
4.1.2.1. Background	38
4.1.2.2. Main goal.....	39
4.1.2.3. Design aspects and success criteria.....	40
4.1.2.4. Timeline and schedule	41
4.1.3. STAKEHOLDERS.....	43
4.1.3.1. Chalmers University of Technology	44
4.1.3.2. Participants.....	45
4.1.3.3. Park- och Naturförvaltningen	45
4.1.3.4. COWI.....	46
4.1.3.5. Children of <i>Gårdsmosseskolan</i>	46
4.1.3.6. Creatures of Gärdsås Mosse	46
4.2. FRAMEWORK APPLICATION	46
4.2.1. REPORT	48
4.2.1.1. Evaluate the continuous parameters (Stage 0).....	48
4.2.1.2. Evaluate the main goal (Stage 1)	50
4.2.1.3. Define project objectives (Stage 2)	51
4.2.1.4. Perform iterative improvement cycles (Stage 5)	52
4.2.1.5. Evaluate project outcomes (Stage 6)	54
4.3. RESULTS AND FINDINGS.....	55

4.2.2.1. Conceptual framework	55
4.2.2.2. Tools and activities	56
4.4. SUMMARY	59
5. CONCLUSIONS AND RECOMMENDATIONS	61
5.1. MAIN CONCLUSIONS	62
5.2. FURTHER APPLICATIONS OF A CO-EVALUATION FRAMEWORK	63
REFERENCES	65
APPENDICES	69

LIST OF FIGURES

Figure 1 – Thematic delimitation of this research	2
Figure 2 – Scope delimitation of this research	2
Figure 3 – Eight rungs on a ladder of Citizen Participation (Arnstein ,1969).	6
Figure4 – “Spectrum of Public Participation” developed by the International Association of Public Participation (IAP2, 2007) and adapted from Nabatchi (2012)	6
Figure 5 – Basis for a definition of co-creation (Adler, 2015, p. 101).....	8
Figure 6 – The role of the evaluator in collaborative, participatory and empowerment evaluations by Chris Lysy (Fetterman, 2018, p. 3).....	10
Figure 7 – The Dynamic Integrated Evaluation Model (von Thiele Schwarz et al., 2016, p. 287).	13
Figure 8 – CO-VALUE conceptual framework, its phases and stages	18
Figure 9 – Schematic of the evaluation criteria to be used in the framework	23
Figure 10 – The twelve continuous parameters allocated in the three evaluation aspects of a participatory process	24
Figure 11 – Design and Planning for Social Inclusion course structure in the period of 2014 - 2018 (Roussou et al., 2019)	29
Figure 12 – Projects that originated the summer course Dare to Build (Hagy et al., 2017).....	31
Figure 13 – Siriusgatan and Gärdsås Mosse in Western Bergsjön	36
Figure 14 – DPSI Group 3 project timeline (McCrea et al., 2018)	38
Figure 15 – The estimated timeline for Dare to Build 2019 (Hagy et al., 2019).....	41
Figure 16 – Schedule of the first week of Dare to Build (Hagy et al., 2019)	42
Figure 17 – Planned process for the application of CO-VALUE	47
Figure 18 – Timeline of the implemented parts of the presented co-evaluation framework	48
Figure 19 – A QR code linked to the online form was displayed on site, for easy access.	48
Figure 20 – Students gathered during the morning brief, prior to the evaluation workshop	51
Figure 21 – The objectives were displayed until a whiteboard that was used for a general daily log. ..	52
Figure 22 – The daily logs were kept in a folder, accessible to all participants.	53
Figure 23 – Midterm evaluation workshop, during the presentation of the groups’ outcomes	53

LIST OF TABLES

Table 1 – CO-VALUE evaluation parameters	19
Table 2 - Table 2 – Intended learning outcomes for Dare to Build (Brandão and Hagy, 2019; Sasic and Hagy, 2019).....	33
Table 3 - Statistics for the residents from Western Bergsjön compared to Gothenburg (Goteborg.se, 2016).	37
Table 4 - Aspects and design criteria of design sub-groups (Hagy et al., 2019)	40
Table 5 - Time constraints for Dare to Build 2019 (Hagy et al., 2019).....	42
Table 6 - Overview of the entities involved in this project, both in DPSI and D2B.....	44
Table 7 - Daily Evaluations, survey questions	49
Table 8 - Evaluating the main goal, survey questions.....	50

LIST OF APPENDICES

Appendix A – Daily evaluations.....71

Appendix B – Evaluating the main goal77

Appendix C – Defining project objectives.....83

Appendix D – Daily logs85

Appendix E – Evaluating project outcomes.....93

Appendix F – Feedback survey.....95

1

INTRODUCTION

1.1. BACKGROUND

Evaluation always proved to be a vital part of urban planning and urban design. In parallel, through the years, the role of participation has been deemed of utter importance when it comes to urban policies, projects and programs, primarily to enable those groups who have been historically excluded.

Design and Planning for Social Inclusion (DPSI) is a design studio – a long project-based course – within the master program Architecture and Planning Beyond Sustainability at the Department of Architecture and Civil Engineering, in Chalmers University of Technology. It runs in the autumn semester (September to January), for 15 weeks. The studio gives knowledge about challenges and opportunities for development in suburban areas built in the 1960s and 70s as part of the Swedish Million Homes Program, areas that now are home to immigrant, low-income inhabitants. Social aspects of sustainable development and citizen participation within architecture, urban design and planning are specific focus areas.

One of the projects conceived by the studio is brought to life in the summer course *Dare to Build* (D2B), which is a 5-week voluntary design and build course, held by the Department of Architecture and Civil Engineering of Chalmers University.

Since evaluation constitutes a relevant part of these co-creative project-based courses (both DPSI and D2B), and the work takes action in segregated, low-income areas, it is of interest to explore new ways of evaluating those projects through this research.

The Swedish Million Homes Program areas and neighbourhoods have been subject to many urban interventions with a strong participatory and co-creative focus. With a supporting literature review and analysis of aforementioned projects, this research aims to be a more thorough learning experience about participatory processes and to contribute to these design courses' next projects, with a co-evaluation conceptual framework.

1.2. OBJECTIVES

With the assumption that these participatory processes have great weight when it comes to designing sustainable, usable and resourceful urban spaces, the objectives of this research are the following:

MAIN GOAL: develop a **methodology** of participatory evaluation for co-creation processes.

- a) Do a **literature review** about participation in urban planning, urban design and evaluation;

- b) Define evaluation **criteria** to assess participatory processes;
- c) Present a **framework** that would strengthen the evaluation of co-creation projects;
- d) Partially assess the framework's **validity** by **testing** it in a Chalmers' design and build course and further analyse the testing results;
- e) Reflect upon the possibility of **bringing** these methods to another **geographical context**, namely Portugal or **other domains and sectors** (e.g. civil society, the private sector, the public sector).

The aim of this approach is also to establish a theoretical and practical exchange of ideas and methods, enabled by the Erasmus+ mobility program.

1.3. DELIMITATION



Figure 1 - Thematic delimitation of this research

The thematic delimitation of this research revolves around the evaluation of co-creation processes, within the fields of urban design and urban planning.

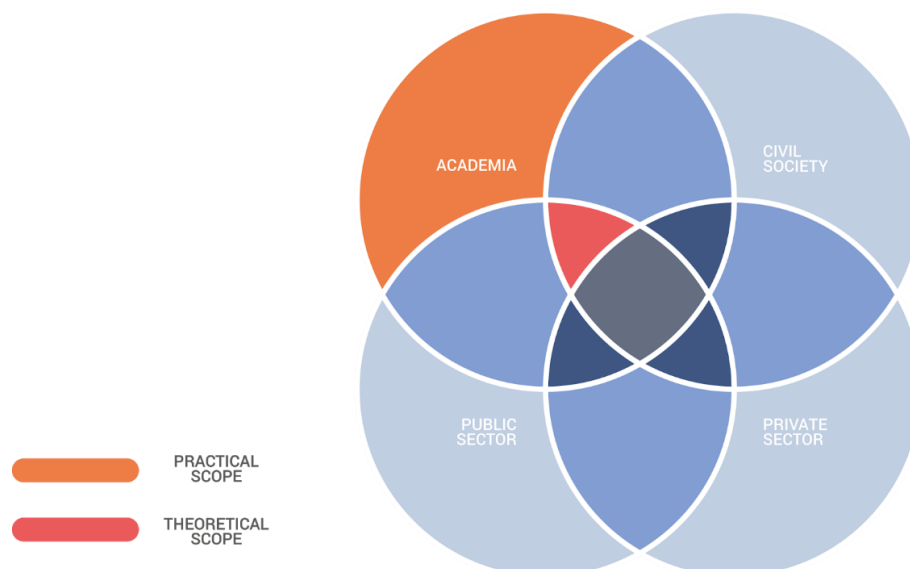


Figure 2 - Scope delimitation of this research

For illustrating the actors' scope of this research, the *Quadruple Innovation Helix* will be used as a visual and conceptual aid. The *Triple Helix*, suggested by Etzkowitz and Leydesdorff (1995), provides an understanding of the set of interactions among *academia* (universities), the *industry* (private sector) and *governments* (public sector), in order to foster social and economic development. This model was extended when *civil society* was introduced by Carayannis and Campbell (2009), making it the *Quadruple Helix*. The authors argue that within a globalised economy all innovation is influenced by culture, values and the media. The increased weight of the public — the citizen — within this quadruple-helix model is consistent with the general principles of participatory processes. These interactions can be immediately associated with the various relationships between the different actors, both in urban planning and urban design.

The theoretical scope of this research will reside in the intersection (or relationships) between academia, civil society and the public sector since they are the three major actors in the case study (Figure X). Due to time constraints and logistical limitations, the framework testing will be limited to evaluate the interactions within the university (teachers, students and course).

1.4. RESEARCH QUESTIONS

This research aims to explore the following questions:

- *How can a literature-based conceptual evaluation framework influence a co-creation project?*
 - *What evaluation parameters are adequate to evaluate a co-creation project (its process, results and outreach)?*
 - *How would different domains/sectors be influenced by adopting such a framework (either positively or negatively)?*
 - *How would this framework be consigned to other geographical contexts?*

1.5. METHOD

The method adopted for this research rests on a literature review, the development of a methodology based on that literature review, the application of the conceived methodology, concluding with a reflective study.

The literature review topics pertain to the origins of participation as a method for development, how it influenced practices in urban planning and urban design and finally how participation can contribute to the practice of evaluation, by mentioning some of the current research in this field.

The methodology was formulated after synthesis of the literature review, which constitutes a co-evaluation framework to be applied in an academic context.

A pilot study of the framework was carried out and reported in this document. The results were discussed, and the findings were made explicit, in order to assess its validity and its limitations.

A reflective study on how this framework would articulate in different domains and contexts, namely Sweden and Portugal, is presented and discussed.

1.6. STRUCTURE

This document is composed of six different chapters, pertaining to the different stages of this research. Specifically, Chapter 1 consists of an introduction to this research, describing its background, objectives, delimitation, main questions, the method used to answer these questions and the structure of the document.

Chapter 2 provides a literature review on participation in urban planning, urban design and evaluation in general.

Chapter 3 presents the methodology that stemmed from the literature review, the co-evaluation framework called *CO-VALUE*. It showcases its main principles, stages and phases, as well as its evaluation criteria.

Chapter 4 describes the pilot study carried out in a summer course led by Chalmers University of Technology, in Gothenburg, Sweden.

Chapter 5 poses additional questions about the possible validity of a co-evaluation framework, namely how such a framework could improve other domains (such as civil society and the public and private sectors) and contexts (namely Portugal).

Chapter 6 concludes this research with some final considerations, recommendations and limitations.

The appendices relevant to this research can be found at the end of this document.

2

PARTICIPATION IN URBAN PLANNING, URBAN DESIGN AND EVALUATION

2.1. PARTICIPATION IN URBAN PLANNING

Citizen participation is not a new concept — it can be traced back to Ancient Greece. Plato, in his most widely read dialogue, *Republic*, describes the concepts of freedom of speech, assembly, voting and equal representation (Plato, Grube and Reeve, 1992). These concepts have transformed and permeated many aspects of human life and development of society while still being intrinsic to our modern democratic systems and practices.

During the 1960s, in the United States and the United Kingdom, a movement of community consciousness led to an increased sense of social responsibility and public involvement when it came to the definition of the physical environment of public places. This movement was aimed to enable the disadvantaged—the “*have-nots*”—giving them the ability to participate in the definition and implementation of planning strategies (Arnstein, 1969). These were largely inspired by the work of Paul Davidoff (1965), that conceptualized *advocacy planning* — a pluralistic and inclusive planning theory where planners sought to represent the interests of diverse groups within society. Davidoff (1965) had foreseen the future of planning being a practice that openly invites political and social values to be examined and debated.

The concept of citizen participation in planning gained popularity among the multiple social, political and civil rights movements of the 1960s and 70s. It widely spread in the United States and some government institutions established practices with this aim, though their implementation was not always accurate nor true to its word. During this period of radical reform, Arnstein (1969) published a provocative take on the relation between the community and the government, using a ladder with eight rungs as a metaphor to the paradigm of citizen power (or lack of it) in the United States (Figure 3).

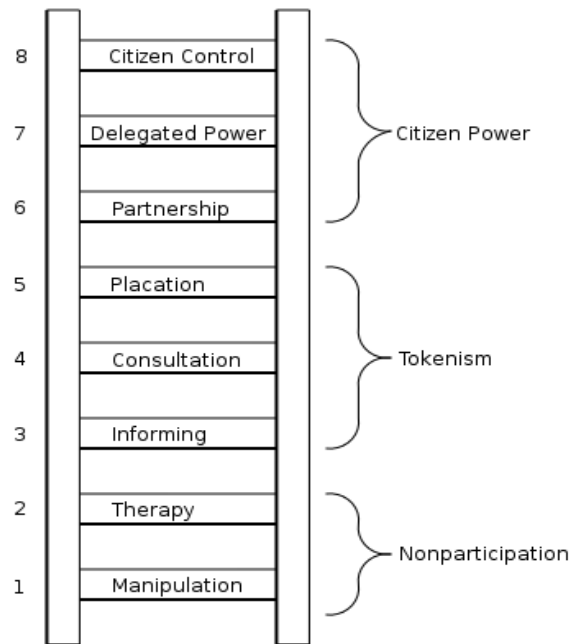


Figure 3 – Eight rungs on a ladder of Citizen Participation (Arnstein, 1969)

At the bottom rung of the ladder, one can find “manipulation” and at the top of the ladder “citizen control”. Even more provocatively, she describes “information”, “consultation” and “placation” as *tokenism*, explained as the “innocuous euphemisms” and “misleading rhetoric” used by the local governments. This led lead minorities to believe that they were empowered when all the core decisions were still being made by the government authorities.

Years later, the International Association of Public Participation (2007) would adapt Arnstein’s ladder to its own spectrum of public participation (Figure 4), inspiring many theorists and practitioners as well.

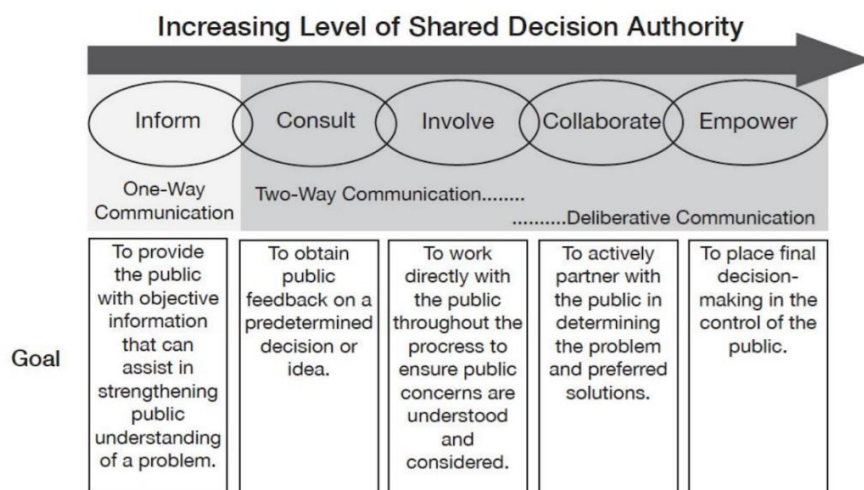


Figure 4 – “Spectrum of Public Participation” developed by the International Association of Public Participation (2007) and adapted from (Nabatchi, 2012).

Social inclusion was then in the spotlight of planning theory, coined as *participatory planning*. Warren Smith (1973) argued that “*participatory planning increased the effectiveness and adaptivity of the planning process*”, opposing to what critics claimed. He explained that the fundamental legitimacy of participatory planning is mainly due to the endorsement, support and most importantly, creation lead by the recipients.

In the 1990s, Innes (1995) pointed out the emergence of a new paradigm in planning, a more “communicative” and practical one, not only aimed at minority empowerment. Within the same paradigm, theorists such as Healey (1996) highlighted the existence of different forms in which spatial planning could be expressed, thus identifying different stakeholders: the government, the planners and the community. During this period, people, companies and other pressure groups started to realise they had a “stake” in planning. Therefore, it proved to be important to promote strategic collaborative placemaking processes among different stakeholders.

2.2. PARTICIPATION IN URBAN DESIGN

These participatory and collaborative trends would also be found in design thinking, influencing many fields of research and practice. Participatory design was rooted in the Scandinavian cooperative design, that saw its beginning in Norway, Sweden and Denmark during the 1970s, as computer professionals strove to allow employees to have more influence on the installation of computer systems in the workplace (Spinuzzi, 2005).

The citizens of western societies began to demand a higher contribution when it came to decision-making about different aspects of their lives, namely, their cities. As an example, the conference of the Design Research Society, held in 1971, in the city of Manchester, had for theme *Design Participation* (Cross, 1972 in Sanders and Stappers, 2008, p.7).

“There is certainly a need for new approaches to design if we are to arrest the escalating problems of the man-made world and citizen participation in decision making could possibly provide a necessary reorientation. Hence this conference theme of “user participation in design”.”

Authors such as Jungk (Cross, 1972 in Sanders and Stappers, 2008, p.7) advocated that participation should not be sought only at the moment of decision, but also when ideas are being generated and developed. This approach, the so-called *participatory design*, would also become an approach to *placemaking* — used to describe the process of creating urban spaces such as squares, parks and streets that would be appealing to people. The term would be born in the 1970s, mostly inspired by citizen ownership of public spaces, advocated by Jacobs (1961) and by Gehl (1971).

Participatory design would be defined by Sanoff (2011, p. 12), as:

“An attitude about a force for change in the creation and management of environments for people. (...) The activity of community participation is based on the principle that the environment works better if citizens are active and involved in its creation and management instead of being treated as passive consumers.”

Participatory design was practised in assorted ways through the years, and new concepts derived from it, such as *co-design* and *co-creation*.

Co-design (or *collaborative design*) stems from the participatory design tradition of the 70s and it is often used as an umbrella term for the latter. The term, though, did not originate from design practice, but from business and marketing (Sanders and Stappers, 2008).

According to Jäppinen and Mattelmäki (2015), participatory design and co-design strive to enable a process in which all stakeholders can work together towards a common goal, regardless of their expertise and/or background. They claim that the difference is the top-down and political approach adopted by participatory design, compared to the genuine partnership that is carried out in co-design. By having users participating across the whole span of a design process, i.e. designing *with* stakeholders, it is possible to better understand their needs and aspirations.

As it was previously mentioned, another recurring term is *co-creation*. Co-creation processes are often “multifaceted” and “complex” and currently, the term itself is vaguely conceptualized in the field of research. According to Sanders and Stappers (2008), it can be translated into any act of collective creativity.

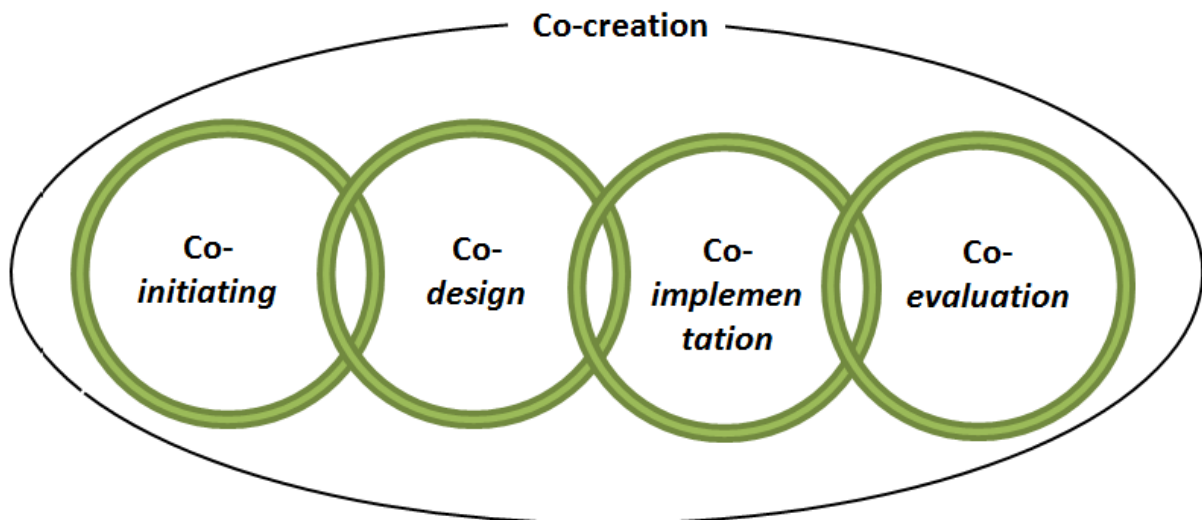


Figure 5 – Basis for a definition of co-creation (Adler, 2015, p. 101).

In a more explicit way, Adler (2015) presents co-creation as a set of instances, namely *co-initiation*, *co-design*, *co-implementation* and *co-evaluation* (Figure 5), as a result of a synthesis between the various inputs that derive from *co-creation* and *co-production*. The *co-* suffix implies collaboration – the act of different entities working towards the same goal, which is different from cooperation – the act of different entities exchanging resources towards achieving their own goals.

The roles of the actors can alternate depending on which of the four phases is being treated. In practice, there can be a back and forth movement through the different phases, rather than chronological order.

2.2.1. TRENDS IN PARTICIPATORY URBAN DESIGN

In a recent paper, Frediani (2016) identified four trends with different types of emphases, which took place throughout the last three decades.

The first one had an emphasis on the *product* of design as a means to alleviate poverty in informal settlements, by improving their access to information, services and facilities. Despite the community engagement fostered by these initiatives, this trend has been criticised for not questioning the political component of unequal power relations that shape these products (Smith, 2008).

The second one relates to the *use* of design, sometimes referred to as human-centered design. It focuses on the relationship between the user and the designer, that is, between practical and technical knowledge. The main objective is to obtain not only responsive but also maintained results over time. The critiques ponder on how this trend is often neglecting human dignity, since it can focus entirely on matters concerned with pure usability, ignoring the potentially adverse consequences (Buchanan, 2001).

The third trend embodies the practice of participatory design around urban governance, tackling the criticisms arguing that participatory planning and participatory design should not be addressing undividedly to manifestations of urban poverty (Hamdi, 1995). It proposes mechanisms through which communities can be better involved in managing and providing urban services, concentrating more on the *process* of design rather than its *product*. It has been criticised, though, for not dealing with issues connected with power (when it comes to consensus building, negotiation and conflict resolution) and scale. Consensus can result in relieving symptoms through immediate interventions, led by more prominent opinions, neglecting opposite voices and points of view that are out-of-the-box (Miessen, 2010).

A fourth trend rose in response, as a practice of social mobilisation, called *agonistic design*. While the previous trend resonates with the practice described by (DiSalvo, 2012) as “design for politics”, which strives to find solutions for given problems within given contexts, this trend focuses on articulating the elements that constitute social conditions —“political design”. This approach seeks to diverge from the traditional patronizing methods which disable controversies by empowering them instead, making every standpoint equally valuable.

Despite the criticism, the last two trends seem to embody the fundamental aspects of participatory design, and both should be kept in consideration. It is of relevance to refer to the work of Nabeel Hamdi (2004), that highlights the importance of small informal incremental interventions and how the trickle-up effect (or self-organised systems) represents more influential changes. He exemplifies this with a simple bus-stop installation in Southern countries, which can result in a group of people using it and creates a small-scale economy (people selling drinks), along with the provision of street lights. Children appear in the area to study under the streetlights due to the lack of electricity in their households, and consequently, booksellers appear in the area.

It is also relevant to mention the work of Jeremy Till (2005), and his reflections of *transformative participation*, which advocates that the line between the expert and the non-expert should be crossed, and design should distance itself from an exclusive problem-solving approach towards a process that makes sense out of realities, opening up for new possibilities.

2.3. PARTICIPATION IN EVALUATION

While different applications of citizen engagement rose over the years as described, the term *participatory evaluation* surfaced alongside them. It has been used by multiple authors who engaged in endeavours to define this and other related terms (Cousins and Whitmore, 1998; Brisolara, 1998). Regardless, the common denominator for this concept is the involvement of individuals, groups or communities who have an interest or role in the project or program which is being evaluated.

One of the first categorisations of *participatory evaluation* diverges into two streams: *practical* and *transformative* (Cousins and Whitmore, 1998).

Practical participatory evaluation aimed to support programmatic and organisational decision making by involving stakeholders in certain aspects of the evaluation process while relying on a lead expert. The term was born in the United States and Canada, with the purpose of fostering the use of evaluation. Its main premise was that by involving stakeholders, the results, ownership and therefore further utilisation would be enhanced (Cousins and Whitmore, 1998).

Transformative participatory evaluation, similar to the views of Jeremy Till (2005) mentioned previously, focuses on the empowerment of those who usually wouldn't have the power or social standing to influence a project. It is framed as the key process for social change (Brisolara, 1998). Being promoted in the 1980s, an important contributor to this approach was Participatory Rural Appraisal, later called Participatory Learning and Action as it was implemented in urban contexts as well (Chambers, 2002).

A distinct term called *empowerment evaluation* emerged (Fetterman and Wandersman, 2005), which would, later on, be put in perspective alongside other approaches of participation in evaluation: *collaborative*, *participatory* and *empowerment evaluation*. These terms were used interchangeably to describe different evaluation approaches, often being used as synonyms (Hadden, 2019). To tackle this, (Fetterman *et al.*, 2017) provide conceptual accuracy as well as examples of each approach, putting in evidence similarities and dissimilarities among them and how they may be combined for better results.



Figure 6 – The role of the evaluator in collaborative, participatory and empowerment evaluations by Chris Lysy (Fetterman *et al.*, 2018, p. 3).

In *collaborative evaluation*, evaluators direct the evaluation process, while creating an ongoing engagement between evaluators and stakeholders, resulting in robust evaluations designs, improved data collection and analysis, and also results which stakeholders can understand and consequently use.

Through *participatory evaluation*, evaluators share control of the evaluation with the ones involved in the project (students, staff members) and other external participants. Together they participate in the agenda planned by the evaluator, which is collectively designed and executed by the evaluator and its team.

Empowerment evaluation shares the control of the evaluation among the staff, participants and community members. However, evaluators do not simply abdicate their responsibility and leave the community to conduct the evaluation by itself. Evaluators serve in this case as “critical friends” or coaches, to ensure the robustness, responsiveness and relevance of the process.

2.3.1. EVALUATION IN PARTICIPATORY DESIGN

Formal evaluations of participatory processes have been carried out almost since the birth of the concept, namely in the early 1980s, although they still appear to be scarce or at least undocumented (Bossen *et al.*, 2016).

2.3.1.1. Classifying participatory design evaluation

In a recent literature survey about evaluation in participatory design, Bossen *et al.* (2016) advocate for more explicit and systematic evaluation methods in order to enhance accountability, learning and knowledge building, and also to strengthen this type of processes, both *internally* — procedures and methods — and *externally* — in terms of outcomes and impacts. As participatory practices are often complex procedures, the evaluation tools used are customarily implicit, which might result in missing opportunities for learning and generating knowledge and a lack of methodological robustness and validity.

Nevertheless, the terms *explicit* and *systematic* do (and should) not translate into exact and overly meticulous methods, ruling over more informal ones. It is possible to evade their undesirable “scientification” since the complexity of urban topics requires mixed, adequate methods which unlock a large spectrum of meaningful results.

Bossen *et al.* (2016) suggest then that every evaluation for participatory design can be assessed while answering seven fundamental questions, which can be rendered into seven major aspects to take into consideration:

a) **Purpose (Why)**

The purpose of the evaluation guides its structure. It can be intended to evaluate the initiation, design or implementation (process) of the project, as well as its outcomes. An evaluation can be summative or formative. Summative evaluations concentrate on what has been made and achieved in a project. Formative evaluations concentrate on how to enhance an ongoing project so it can improve during its course. These two procedures focus on the purposes of decision making and project improvement, but evaluations can have other purposes such as developing knowledge, enhance democracy, improve the practitioners' skills, empowering the community, accountability or control, among others.

b) Facilitator (*By whom*)

The person responsible for conducting the evaluation can be *internal* and *external*. It can also be *independent* or *closely associated* with the project.

c) Participants (*With whom*)

Participants might include *all* or a *selection of stakeholders*. They can be project staff (students, employees), project managers (teachers, team leaders), community members or representatives, central decision-makers (heads of studies or departments) and funders (politicians).

d) Criteria (*What*)

Criteria can be established before the start of a project, developed during or after it has been concluded. Determining criteria before can be effective when the context and means are constant and known, though when a higher level of complexity is in place, continuous learning should occur. These findings can be achieved through an evaluation process which occurs during or after the project is completed.

Another relevant matter to take into consideration is whether the criteria will be defined by the evaluator or the stakeholders, and if so, which ones.

Von Thiele Schwarz *et al.* (2016) suggest operationalising objectives into outcomes at the beginning of a project, making them the criteria to be evaluated. Outcomes can be related to the organisation (such as a school or a company) and to the intervention itself.

e) Method and Approach (*How*)

Relating to data gathering, the methods used for evaluation can range from quantitative, qualitative or mixed.

There are also different participation approaches that can be taken (see section 2.3), and which can fit a variety of different tools and methods. They can range from collaborative, participatory and empowering, as proposed by Fetterman *et al.* (2018).

f) Intended audience (*For whom*)

The results obtained in an evaluation process might have different audiences that can range from the project managers and members to the remainder of the mentioned stakeholders, and also the research community.

g) Intended use (*For what*)

The use of an evaluation product can vary: it can serve both as a learning tool and for community gains, as well as to research the very act of participation and the processes associated with it in order to improve the existing theory and models and its practice. Another use of an evaluation product is to inform about decision-making processes.

Though Bossen *et al.* (2016) do not refer to it in this literature review, another relevant aspect to take into consideration is the *timing* of the evaluation. It can be divided into *ex-ante*, *ongoing* and *ex-post*. *Ex-ante* evaluations take place at the beginning of a process, as they promote comparison between

possible alternatives in order to choose the best alternative. *Ongoing* evaluations take place during implementation and its conclusions can lead to changes in the process. *Ex post* evaluations occur at the end of the implementation and focus on the impacts of the plan (Oliveira and Pinho, 2010).

These, however, usually refer to *episodic* evaluations, which are usually static, infrequent, goal-seeking and time-bound. On the other hand, *continuous* evaluations are emerging, ongoing, endless and adaptable over time (von Thiele Schwarz *et al.*, 2016).

To conclude, these eight aspects also prove to be relevant for the design of an evaluation process, and not only its classification and study.

2.3.1.2. Continuous evaluation in participatory design

Within the field of occupational health, the Dynamic Integrated Evaluation Model (DIEM), proposed by von Thiele Schwarz *et al.* (2016), focuses on evaluating a co-creation process to improve and adapt an intervention over time, relying on daily organisational practices that translate into sustainable changes and improvements. The evaluation is fitted into a co-created iterative intervention process, that can be continuously adapted (Figure 7).

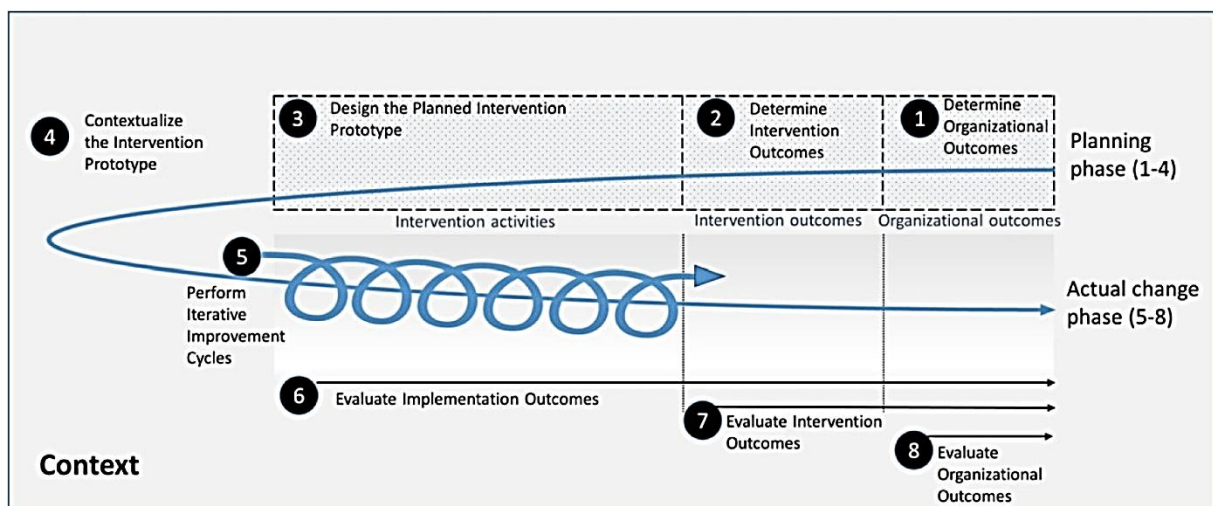


Figure 7 – The Dynamic Integrated Evaluation Model (DIEM) (von Thiele Schwarz *et al.*, 2016, p. 287).

This model is subdivided into two phases, planning and actual change.

Steps 1 and 2 focus on *determining objectives* which are operationalised into two types of outcomes: *organisational* and *intervention*. *Organisational* outcomes are those connected to the team responsible for the intervention (eg. project managers or teachers, project members or students). *Intervention* outcomes can be split into two subtypes: *implementation* and *target* outcomes. The *target* outcomes are deeply connected with stakeholders (such as funders, companies or the community), as they translate the goals of the intervention itself. As for the *implementation* outcomes, they are the intermediate goals to be fulfilled during the implementation of the intervention. It is stressed that it is crucial to achieving the intended outcomes rather than to implement a specific intervention. Both these steps can be seen as part of the *co-initiation* stage of the co-creation process proposed by Adler (2015).

Step 3 involves the *design of the planned intervention* both by the project team and other stakeholders. This stage involves the definition of activities that fall under the proposed outcomes and work towards achieving them. In the context of urban design, this could correspond to the design prototype of the actual urban intervention. The questions posed here are *what, when, where, how often* and *involving whom*.

Step 4 aims to *contextualise the intervention prototype*. Stakeholders are involved in understanding and assessing whether the intervention holds up in their local context and reflect on what potential contextual and implementation factors may influence the intervention. Steps 3 and 4 relate to the co-design phase of the co-creation process mentioned earlier.

Step 5 consists of *performing short iterative improvement cycles* that can be used for self-reflection and continuous development of the intervention, with repeated measurements. Stakeholders gather in order to understand if there are any feasible changes that can be implemented in the intervention.

Step 6 *evaluates the implementation outcomes for improvement*. Some implementation outcomes proposed are *acceptability, adoption, appropriateness, feasibility* and *sustainability*. to the implementation phase at hand. These represent key factors to be considered so that each activity can be repeatedly assessed while it is being implemented. Different implementation outcomes are applicable, depending on the activities being performed. Examples of methods to apply in this phase are short self-ratings, verbal version of fixed schedule event diaries (asking teams their perceptions on the teamwork, what worked well and what can be done differently). Observations can be time-consuming, but they can be done by managers or staff in their daily routines. Steps 5 and 6 happen simultaneously as they are linked, and they belong to the co-implementation stage.

Step 7 and 8 *evaluate the intervention and organisational outcomes* since they also need to be monitored, either continuous or in short intervals. Data that already exists should be used, to avoid reinventing the wheel. It makes the collection cheaper and less invasive, with the only drawback of it being either flawed or outdated. These steps belong to the co-evaluation stage of the co-creation process.

Though it is not specific for urban design, DIEM shows features that could be easily translated into the field of urban planning and urban design, being its main feature the emphasis put in the ongoing dynamic intervention process. It can correlate to the benefits of continuity of small-term practices in urban projects (Martilla, 2018), in order to ensure long-term success and regeneration of an intervention.

Moreover, DIEM and the co-creation process proposed by Adler (2015) overlap, showing that it is possible to merge elements from one and the other. Adding to this, the notions of collaborative and empowerment evaluation, an evaluation framework can be put together with these elements.

2.4. SUMMARY

The concept of citizen participation in planning gained popularity among the multiple social, political and civil rights movements of the 1960s and 70s, in the United States. During this period, Arnstein (1969) published a provocative article about the different types of relationships between the community and the government, comparing them to a ladder with eight rungs - manipulation and therapy (non-participation), informing, consultation and placation (tokenism), partnership, delegated power and citizen control (citizen power) - as a metaphor to the paradigm of citizen power (or lack of it). Social inclusion was in the spotlight of planning theory, coined as *participatory planning*, and it was argued that it increased the effectiveness and adaptivity of the planning process. (Smith, 1973).

A new paradigm in planning emerged in the 1990s, not only aimed at minority empowerment. It highlighted the identification of different stakeholders since people, companies and other pressure groups started to realise they had a “stake” in planning (Innes, 1995).

These participatory and collaborative trends would also be found in design thinking, giving origin to *participatory design*, that saw its beginning in Norway, Sweden and Denmark during the 1970s. Participatory design was practised in assorted ways through the years, and new concepts derived from it, such as *co-design* and *co-creation*.

A few trends can be identified in participatory urban design. One around urban governance, with mechanisms through which communities can be better involved in managing and providing urban services through consensus, concentrating more on the *process* of design rather than its *product* (Hamdi, 1995); and another as practice of social mobilisation, called *agonistic design*, focusing on articulating the elements that constitute social conditions while seeking to empower controversies, making every standpoint equally valuable.

While different applications of citizen engagement rose over the years as described, the term *participatory evaluation* surfaced alongside them. A distinct term called *empowerment evaluation* emerged (Fetterman, 2005) and it was put in perspective alongside other approaches of participation in evaluation: *collaborative*, *participatory* and *empowerment evaluation*. In the past, these terms were used interchangeably to describe different evaluation approaches (Hadden, 2019), providing now conceptual accuracy.

Concerning evaluation in participatory design, Bossen *et al.* (2016) suggest each evaluation process can be rendered into seven major aspects: purpose, facilitator, participants, criteria, method and approach, intended audience and intended use.

The Dynamic Integrated Evaluation Model (DIEM) is an example of evaluation being practice within a participatory process, within the field of occupational health. Proposed by von Thiele Schwarz *et al.* (2016), it focuses on evaluating a co-creation process to improve and adapt an intervention over time, relying on daily organisational practices that translate into sustainable changes and improvements. The evaluation is fitted into a co-created iterative intervention process, that can be continuously adapted.

3

CO-VALUE, A CO-EVALUATION FRAMEWORK

The methodology adopted in this research is a literature-based conceptual framework, which stemmed from the literature review based on participation in urban planning, urban design and evaluation. The framework is meant to represent a working hypothesis, later to be practically explored by the means of a partial pilot study, not only to assess its validity but to answer the research questions.

CO-VALUE is thus a literature-based co-evaluation framework. Co-evaluation here stands for a coordinated, collaborative assessment of a shared project or initiative.

3.1. PRINCIPLES

Taking the literature review into consideration, the following characteristics were considered significant for CO-VALUE, the conceptual framework for co-evaluation of co-creation processes hereby proposed:

- **Continuous**
This refers to two different aspects of continuity: one that supports an ongoing process, always present from the start until the conclusion of a project, and one that pertains to the hand-over of a project back to the community and stakeholders.
- **Incremental**
It enables a way of thinking that gives priority to small-scale, incremental changes (Hamdi, 2004) over large-scale actions, that are much more difficult to reproduce and also to revert.
- **Iterative**
Repeated measures that can be used for self-reflection and continuous development of the project should be favoured in order to assess possible changes that can be implemented, supporting non-linearity.
- **Empowering**
The sharing of control among actors — namely project staff/students and community members — is supported, leading to more accountability, engagement and ownership over these processes.

- **Informal**

Informal, qualitative methods are more suited to evaluate complex and ever-mutating situations and processes.

- **Explicit**

Though the methods and tools applied should be mostly informal, does that not exclude the opportunity for them to be explicit, which means being properly reported and handed-over, so continuity is assured and the learning opportunities are not missed.

3.2. PHASES AND RESPECTIVE STAGES



Figure 8 – CO-VALUE conceptual framework, its phases and stages

The evaluation process follows a variation of the co-creation phases proposed by Adler (2015), each of them explained below.

The co-creation phases split into 8 evaluation stages. These stages are not linear and can happen simultaneously while redirecting to previous ones, as shown in Figure 8. It is important to stress even though not all co-creative processes will make use of all phases here presented (for instance, a co-creative design project does not present a co-implementation phase), the stages of the relevant phases are still applicable.

Apart from Stages ∞, 4 and 5 that are continuous, all the others can be either continuous or episodic.

The phases and respective stages proposed are described in more detail in the next sections.

3.2.1. CO-EVALUATION

Though Adler (2015) proposes co-evaluation as a standalone phase of co-creation, following the arguments advocated by von Thiele Schwarz *et al.* (2016), this research considers the importance of having a continuous co-evaluation, which is present throughout the whole process. By doing so, one can ensure an interrupted process of evaluation.

∞ Evaluate the continuous parameters

It is important to perform systematic, small, reflective evaluations concerning the ongoing state of each phase, in order to assess its consistency with the main goals, objectives and also if participation is kept in consideration throughout the whole process. This will enable an understanding of the perception and opinions towards the work of the project and whether the objectives set are still applicable.

In order to perform this continuous evaluation, twelve evaluation parameters are suggested, which are based on the implementation outcomes proposed by von Thiele Schwarz *et al.* (2016) and the empowering evaluation principles proposed by Fetterman *et al.* (2005). These parameters can originate different survey questions or activities, depending on the phase or stage of the co-creation process. They are listed in Table 1.

Table 1 – CO-VALUE evaluation parameters

PARAMETER	DESCRIPTION	EXAMPLE QUESTIONS
ACCEPTABILITY	Attitudes towards the initiative, satisfaction, receptivity	<i>Do you look forward to the changes that the project will lead to?</i> <i>Do you expect the project to bring about positive outcomes?</i>
APPROPRIATENESS	Perceived fit of both the co-creation process and planned goals and objectives, relevance	<i>Is the project relevant to the context where it will be implemented?</i> <i>Does this project meet your personal learning goals?</i>
CAPACITY BUILDING	Harnessing and improvement of skills, knowledge, tools, equipment and other resources needed	<i>What capacities do you need to put this project into place?</i>
DIRECTION	Awareness about which tasks to perform and how the work being done is related to the main goal and objectives	<i>Is it clear to you what you should do?</i> <i>Is it clear to you how the project is related to the main goals and learning objectives?</i>
INCLUSION	Involvement from the community and other actors; diversity of the actors involved	<i>How involved was the community in this process?</i> <i>How many different stakeholders were involved in this project?</i>

KNOWLEDGE	Use of knowledge from the different actors and relevant people	<i>In your opinion, was the knowledge of relevant stakeholders taken into consideration? Who do you think needs to be consulted for this stage?</i>
ITERATIVITY	Building on successes, learning from mistakes, making mid-course corrections	<i>Have you had the opportunity to trace back to some mistakes done and make an improvement?</i>
OWNERSHIP	Value given to stakeholders' control and their feeling of ownership over the progress of the project	<i>Do you feel any ownership for the work you have performed so far? Why?</i>
SUPPORT	Support received and given by the stakeholders participating in the project	<i>Have you been given enough information about what is expected of you? Have you been given enough support to perform all the activities?</i>
COMMUNICATION	Promotion to the community, connection with the stakeholders	<i>Have you been informed about this project? How would you classify the promotion among the community?</i>
ALTERATION AND DEVIATIONS	Translation of initially co-created plans into the actual activities, changes made and reasons why	<i>Are there already some differences between the initial proposal and what you have accomplished so far?</i>
CONTRIBUTION	Contributions from all levels	<i>How did I participate? Did I make myself included? Did I always contribute to X?</i>

3.2.2. CO-INITIATION

1. Evaluate the continuous parameters

This stage aims to assess the pertinence of the goals established as well as the perception and opinions of the different stakeholders and actors while taking the context into consideration. Some of the evaluation parameters can be used to support this phase, such as *acceptability*, *appropriateness* and *direction*. Evaluating the main goal will allow project leaders to understand if the project members and other collaborators are in agreement with it, deem it relevant, and/or comprehend fully what is expected of them.

2. Define objectives

In this research, two types of objectives were considered, based on the ones proposed by von Thiele Schwarz *et al.* (2016): (i) *learning objectives*, which concern the different actors involved in the project and the team working on the initiative and (ii) *project objectives*, which related to the project itself.

The learning objectives stem from the organisational objectives described by von Thiele Schwarz *et al.* (2016). All participatory processes imply the existence of a moment of learning for all the actors involved. It is ideally one of the drivers for such a collaboration, hence the importance of formulating these objectives with the knowledge and experience of all stakeholders and actors.

In order to evaluate the progress and success of the project, it is pertinent to operationalise the proposed main goal into objectives. These objectives should be as concrete as possible, in order to better assess their fulfilment. Doran (1981) proposed a simplistic way to frame and write objectives that help their tracking within project management. It consists of five criteria that should be taken into consideration and that fit in the acronym S.M.A.R.T. Later on, other criteria were suggested by different authors that, though they differ from the original proposal, they still fit in the acronym proposed by Doran. The suggested criteria for this research are:

- **Specific**, as it should target a specific area for improvement or intervention;
- **Measurable**, as the objective should be quantifiable or at least suggest a progress indicator;
- **Achievable**, the objectives set should be achievable within the timeframe allocated for the project at hand;
- **Relevant**, the objectives established should be relevant for the organisation, for the stakeholders and the community, in general;
- **Time-bound**, as it should be specified when the outcomes should be achieved.

By having these criteria taken into account, the process of establishing objectives can be immediately evaluated, giving the chance to rapidly and iteratively improve them as they are conceived. It is not mandatory that all five criteria are meticulously fulfilled, as these should be interpreted as guidelines to formulate a meaningful objective.

These objectives become themselves success criteria to be evaluated throughout the whole project process.

This process should foresee the involvement of stakeholders, either in the creation or by giving them the opportunity to evaluate and contextualise these objectives.

3.2.3. CO-PRODUCTION

3. Evaluate the proposed solution

Just like in the first stage *Evaluate the main goal*, it is also necessary to evaluate the pertinence of the proposed solution, not only after it is suggested, but also while it is designed and/or prototyped.

4. Perform iterative improvement cycles

To follow the iterative principle advocated in this research, performing iterative improvement cycles will enable the constant and continuous development of the solution in the co-production phase. These improvement cycles will be enabled by the systematic evaluation of the continuous parameters, whose findings will prompt action towards issues found or preserving good practices. This way, the solution can be continuously improved and consequently, it will suit better the needs of the stakeholders and context.

Some tools prove to be useful for this purpose, such as daily and weekly logs, time allocation diaries and objectives tracking.

3.2.4. CO-IMPLEMENTATION

5. Perform iterative improvement cycles

Though it is more feasible to perform changes in the co-production phase (which involves designing and prototyping), there are still some changes that can be done in the co-implementation phase, and that should be addressed if possible.

Once more, in order to engage in these improvement cycles, the tools mentioned are equally useful, but since the work of the co-implementation phase is probably more definitive, the issues encountered might be more difficult to tackle. Regardless, it is still valuable to identify these problems and good practices in due time, for both handing over the project to the relevant actors and to make the learning experience more explicit for future years while it is dutifully reported.

3.2.5. CO-ACHIEVEMENT

6. Evaluate project outcomes

This stage initiates with the nearing conclusion of the co-implementation phase, and with the fulfilment of the main goal and objectives. It is then of importance to evaluate the outcomes and confront them with the objectives that were set at the beginning of the project. This task will be easily manageable if the objectives were written following the S.M.A.R.T. criteria.

The data gathered with the support of the continuous parameters will help the evaluators understand the flow and progress of the process, its issues, its good practices and also *dos* and *don'ts* for future instances. The continuous parameters themselves can contribute for a final, episodic assessment of the project.

7. Evaluate learning outcomes

Likewise, as learning objectives were set at the beginning of the project, their fulfilment should also be assessed.

3.2.6. CO-DELIVERING

8. Evaluate the hand-over

In order to ensure continuity, processes should be adequately handed over to the relevant stakeholders. Evaluating this step will enable the learning process and allow to identify issues and good practices. This knowledge will also be potentially useful for future projects.

3.3. EVALUATION CRITERIA

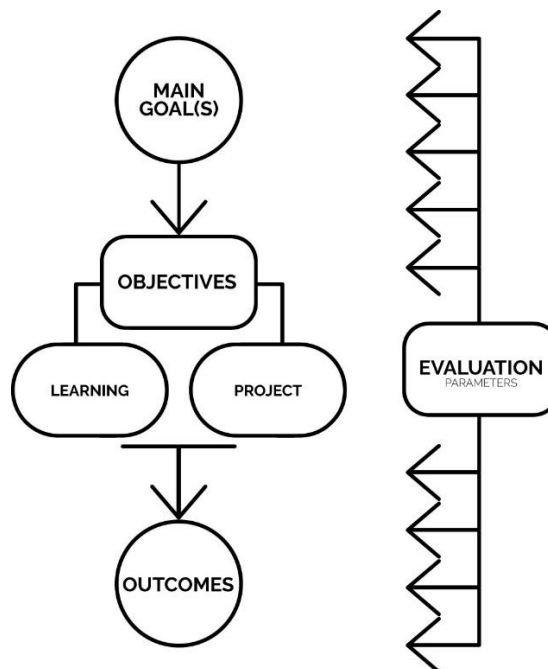


Figure 9 – Schematic of the evaluation criteria used in the framework

As mentioned in the previous section, the main goals and objectives differ in nature — the main goals are the long term results the organisation is willing or needs to achieve. These goals can be broken (operationalised) into smaller increments, here called objectives. Main goals are often open, unstructured and/or fluid and are directional in nature, while objectives tend to lead to single feasible outcomes. They are concrete in statement and purpose and show no ambiguity as to whether they have been achieved or not.

Thus, the process used for this framework consists of the episodic assessment of the main goal at the beginning of the project and a systematic assessment of the proposed objectives. One of the sets of criteria to be assessed is then the level of fulfilment of these objectives.

The other set of criteria consists of the twelve evaluation parameters mentioned in the section above, deemed important for the continuous evaluation of a co-creation process. These parameters will generate different survey questions and activities throughout the evaluation process.

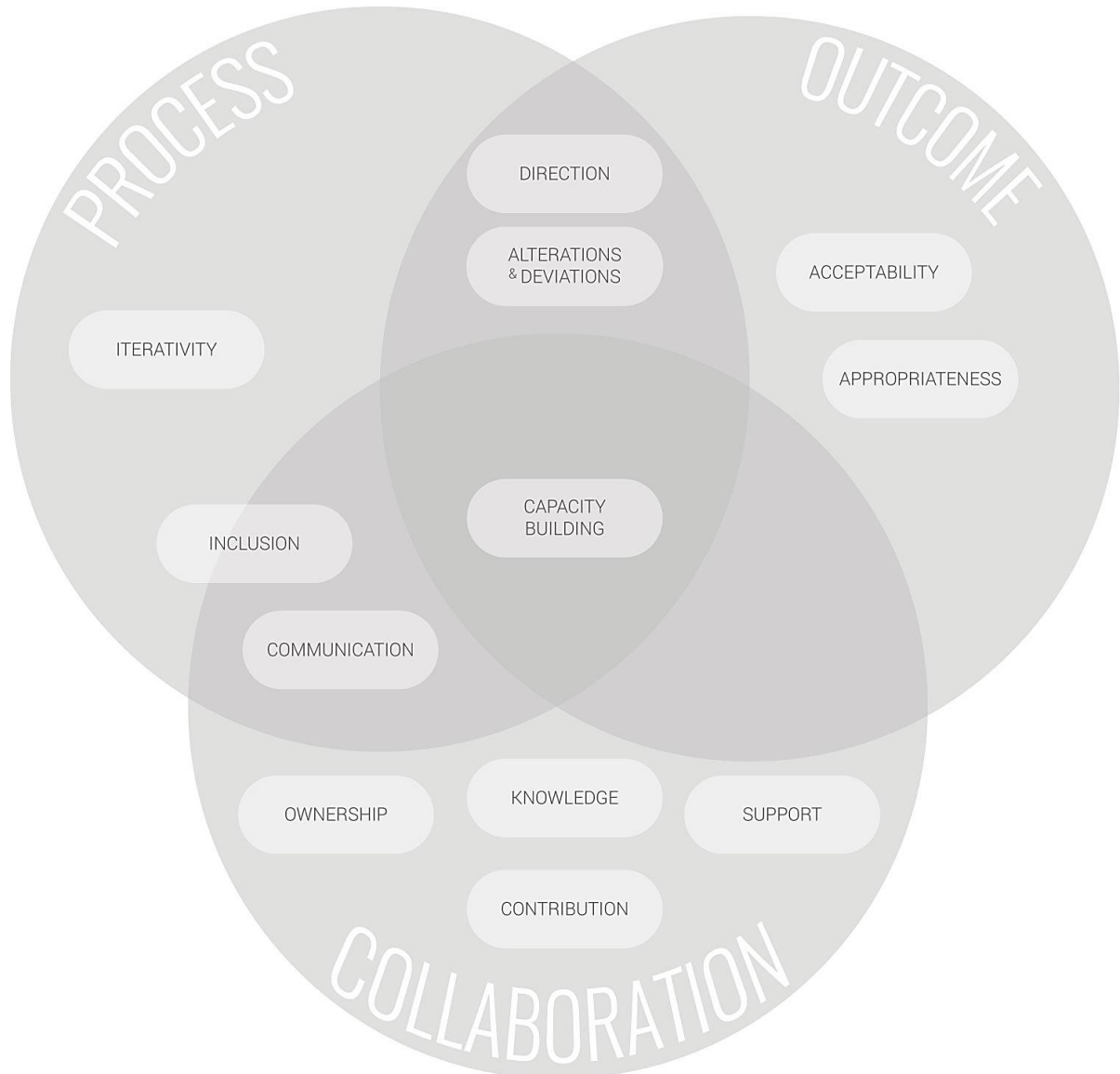


Figure 10 – The twelve continuous parameters allocated in the three evaluation aspects of a participatory process

The different factors can be allocated in three evaluation aspects — process, outcome and collaboration.

Not all factors will be appropriate for every single phase of the co-creation process, but all of them can provide tailored insight into the work which is being done in each one of them.

As it was mentioned previously, it is also of relevance to collect continuous data regarding these factors throughout the whole co-creation process. Comparing the actors’ and/or stakeholders’ impressions for

each of them and examining their chronological progress can help find new issues or identify good practices.

3.4. SUMMARY

The methodology adopted in this research — CO-VALUE — is a literature-based co-evaluation framework, which stemmed from the literature review based on participation in urban planning, urban design and evaluation. Co-evaluation here stands for a coordinated, collaborative assessment of a shared project or initiative. A set of characteristics were considered significant for CO-VALUE, the conceptual framework for co-evaluation of co-creation processes proposed. They are *continuous, incremental, iterative, empowering, informal and explicit*.

The evaluation process follows a variation of the co-creation phases proposed by Adler (2015), splitting into co-creation phases split into 8 evaluation stages. They are: for *co-initiation*, (1) *Evaluate the continuous parameters*, (2) *Define objectives*; for *co-production*, (3) *Evaluate the proposed solution*, (4) *Perform iterative improvement cycles*; for *co-implementation*, (5) *Perform iterative improvement cycles*; for *co-achievement*, (6) *Evaluate project outcomes*, (7) *Evaluate learning outcomes*; for *co-delivering*, (8) *Evaluate the handover*. These stages are not linear and can happen simultaneously while redirecting to previous ones. Not all co-creative processes will make use of all phases presented in this framework, however, the remaining evaluation stages are still applicable.

The evaluation process of this framework consists of the episodic assessment of the main goal at the beginning of the project and a systematic assessment of the proposed objectives. One of the sets of criteria to be assessed is then the level of fulfilment of these objectives. The other set of criteria consists of twelve evaluation parameters deemed important for the continuous evaluation of a co-creation process. They are *acceptability, appropriateness, capacity building, direction, inclusion, knowledge, iterativity, ownership, support, communication, alterations and deviations and contribution*.

The different factors can be allocated in three evaluation criteria — process, outcome and collaboration. Not all factors will be appropriate for every single phase of the co-creation process, but all of them can provide tailored insight. It is of relevance to collect continuous data regarding these factors throughout the whole co-creation process.

4

PILOT STUDY

For assessing the proposed methodology's validity, a pilot study was performed in a *design and build course* carried out by the Department of Architecture and Civil Engineering of the Chalmers University of Technology. It was only possible to assess a set of steps described in the framework due to time and collaboration constraints.

The course was chosen for this pilot since it is a follow-up of Design and Planning for Social Inclusion (DPSI), where students are challenged to put participatory and co-creation processes in practice in order to formulate their ideas and interventions. During autumn, students from DPSI work embedded in the community with local stakeholders and develop with different design projects. One of these projects is chosen to be carried out in the Dare to Build summer course, this time by students of both engineering and architecture backgrounds.

Due to its collaborative and co-creative nature among students and teachers of different backgrounds as well as summer student workers from all over Gothenburg, acting in the Swedish Million Homes Program areas (see section 4.1.1.4), this course proves to be an adequate environment to perform a preliminary test of this conceptual framework.

4.1. CASE DESCRIPTION

4.1.1. CONTEXT

4.1.1.1. Design and Planning for Social Inclusion

Design and Planning for Social Inclusion (DPSI) is a long project-based course within the Master Program of Architecture and Planning Beyond Sustainability at the Department of Architecture and Civil Engineering, at the Chalmers University of Technology. It challenges its students to intervene in suburban areas built in the 1960s and 70s as part of the Swedish Million Homes Program, mentioned in the section above. This studio provides professional tools aimed at architects, designers, planners and engineers to analyse and design solutions through methods of citizen participation while having in mind the social aspects of sustainable development.

The studio projects are meant to put participatory and co-creation processes in practice, by allowing its students to, not only harness basic theoretical knowledge but also to be creative and apply it at will. Social aspects of sustainable development and citizen participation are specific focus areas.

The learning objectives of this design studio are translated into five main themes (Brandao *et al.*, 2018):

a) **Analysis**

To describe and analyse the local context of a Swedish Million Homes Program area, regarding its physical environment, sociocultural characteristics and global trends and issues (segregation, gender inequalities, ethnic discrimination and climate change) while taking into account differences in perspectives among the actors.

b) **Participatory tools and methods**

To carry out planning and design projects in collaboration with citizens and other local actors while designing appropriate participatory tools and methods and applying, examining and analysing these tools and methods as part of the project work.

c) **Design methodology and skills**

To design a proposal that aims to contribute to sustainable development in the studied area that emphasises social and cultural aspects and the improvement of living/working conditions, while taking off from existing local conditions and using knowledge and skills of varied fields (such as architecture, planning, design, engineering, etc.).

d) **Presentation and communication**

To communicate the work performed in a suitable way to a broad target group of local and external actors in an oral stage presentation and in an exhibition with posters and optionally models and other exhibition materials.

e) **Critical reflection**

To analyse and reflect critically on own practice in the project work regarding the student's role in the project group, the project work in relation to the local community, the design proposal and potential conflicts between different aspects of sustainability, and between different stakeholders' interests.

The course consists of a full-time working schedule (40 hours a week) of lectures, workshops and project work. The curriculum includes:

- Impressions;
- Observations, analysis and understandings;
- Reflections and engagement in subjects;
- Focus and delimitation;
- Dialogue and participation;
- Experiment, improvise, co-design, co-create;
- Project work in smaller groups;
- Join exhibition, oral presentations, co-evaluation, hand-over, examination;
- Critical reflection, feedback.

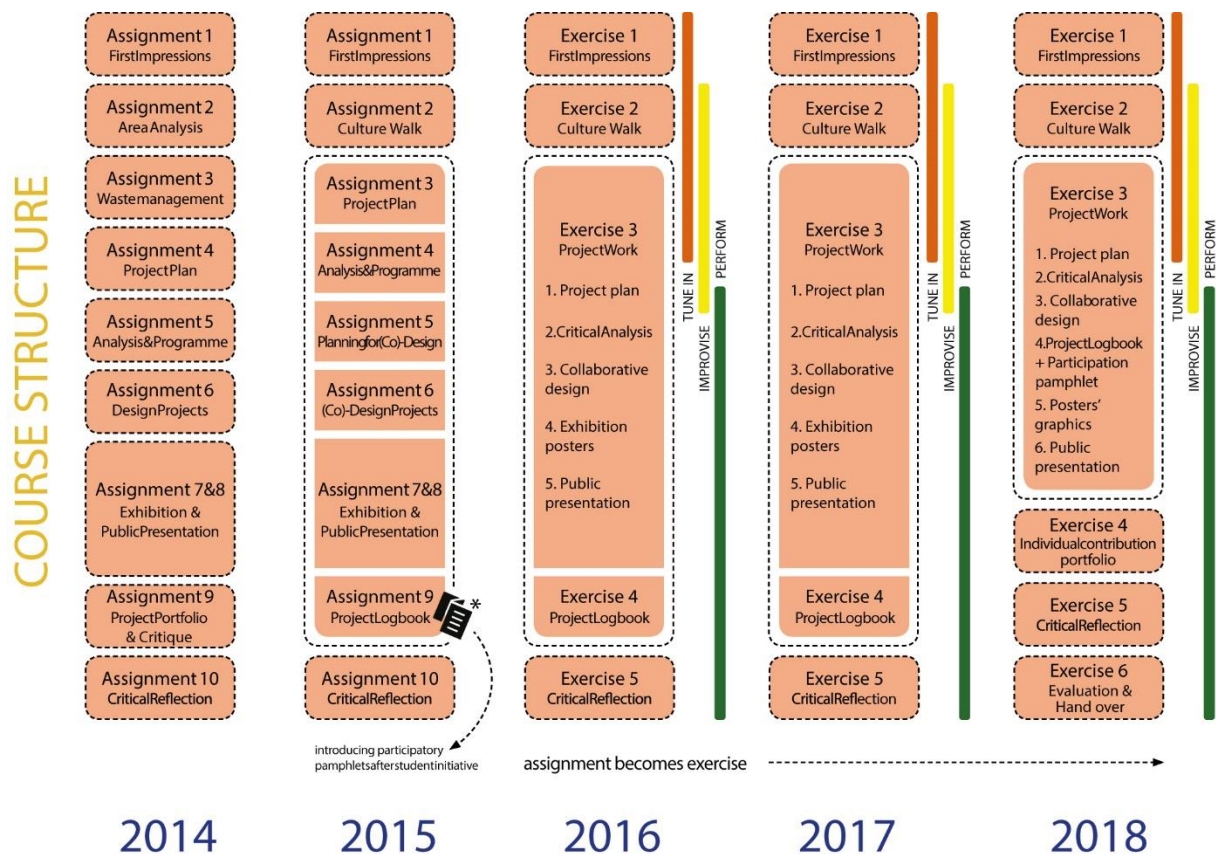


Figure 11 – Design and Planning for Social Inclusion course structure in the period of 2014 - 2018 (Roussou et al., 2019)

The course's structure has been changing throughout the years, and since 2016, it is lead through a set of three stages, that frame the motto of the course: *tune-in*, *improvise* and *perform*.

In the first phase, *tune-in*, which lasts 2 to 3 weeks, students learn about the context they will work on (Hammarkullen, northeastern districts of Gothenburg and other Million Program areas) and about the people living and working there. Students are expected to start working in their projects within small groups, by developing a project plan, in which they design the strategy and timeframe for their interventions. An analysis will also take place on this stage.

The second phase, *improvise*, provides lectures and workshops on dialogue and participatory methods within architecture and planning. It has a strong emphasis on moderating dialogue processes and collaboration among different actors and stakeholders. In this phase, students have the chance to experiment and design their participatory processes. It lasts around 2 to 3 weeks.

The last phase, *perform*, relates to the collaborative design of the projects and the chosen processes. It is the longest period — 7 to 8 weeks — and students develop their plans closely with the citizens, organisations and other relevant stakeholders. In the last weeks of this phase, these actors are invited to a public presentation of the work accomplished by these projects, in order to receive feedback and also to give something back to the community. A final co-evaluation workshop also takes place in this phase,

where projects are evaluated in collaboration with the involved stakeholders and a hand over package of material is prepared.

The course has different elements of evaluation throughout the semester, with different purposes. These revolve around the success of each group project and the expected learning outcomes, outlined by the responsible teachers. These are:

- **Weekly logs**

During the course, students were proposed to elaborate weekly logs, that consisted of registering their daily activities for that week and answering three weekly questions:

- What did we do?
- What did we learn?
- What will we do next?

These questions proposed a weekly reflective moment that would allow students to understand what happened during the week at hand and decide upon a course of action for the next week.

- **Participatory/co-design workshops**

The students work within a co-creation process, meaning that stakeholders are also creators, designers, etc. The aim of these workshops is to go beyond consultation and work *with* stakeholders.

- **Critical reflection**

With the help from literature, seminars and workshops, students are given the task to develop their own critical written reflection about their learning process throughout the course, how the project proceeded and how their professional competencies have developed. This critical reflection comes in the format of a paper, which is used for a brief discussion in a seminar with the whole group.

- **Final critique**

The final critique is held in the last days of the course and it is divided into three workshops: one aimed for stakeholders, another for planning the next steps and one to co-create a studio poster for the course.

The first workshop is a co-evaluation and hand-over of the project with the different stakeholders. This workshop is led by the student project groups, which have to prepare a short form which includes a set of questions for evaluating their project together with the stakeholders. These questions should be planned according to the topics *process*, *outcome* and *collaboration* and formulated in a way that both the group members and stakeholders can extract useful information from the final results. The last questions of this form are proposed by the teachers, they are:

- What is the most important information/material that is needed in order to hand the project over to the stakeholders?
- What form should this information/material be handed over as?

At the end of the workshop, and together with the stakeholders, students should prepare a hand-over package for stakeholders, which consists of a selection and rearrangement of the materials produced throughout the course work. This package should be tailored based on the specific

needs, outcomes of the project and the stakeholders' choices, wishes, needs and interests. Students and stakeholders decide together what is included in this handover package. After that, students prepare the materials and send them formally as a handover to the same stakeholders.

One of the students' projects will have the opportunity to be brought to life by another course, held in summer by the Department of Architecture and Civil Engineering – Dare to Build (section 4.1.1.2.).

4.1.1.2. Dare to Build

Dare to Build (D2B) is a voluntary summer course of the Department of Architecture and Civil Engineering at Chalmers University of Technology, credited with 7 ECTS. It aims to improve the collaboration between engineering and architecture students while simultaneously contributing to communities within the same context as DPSI, through a co-creative approach.

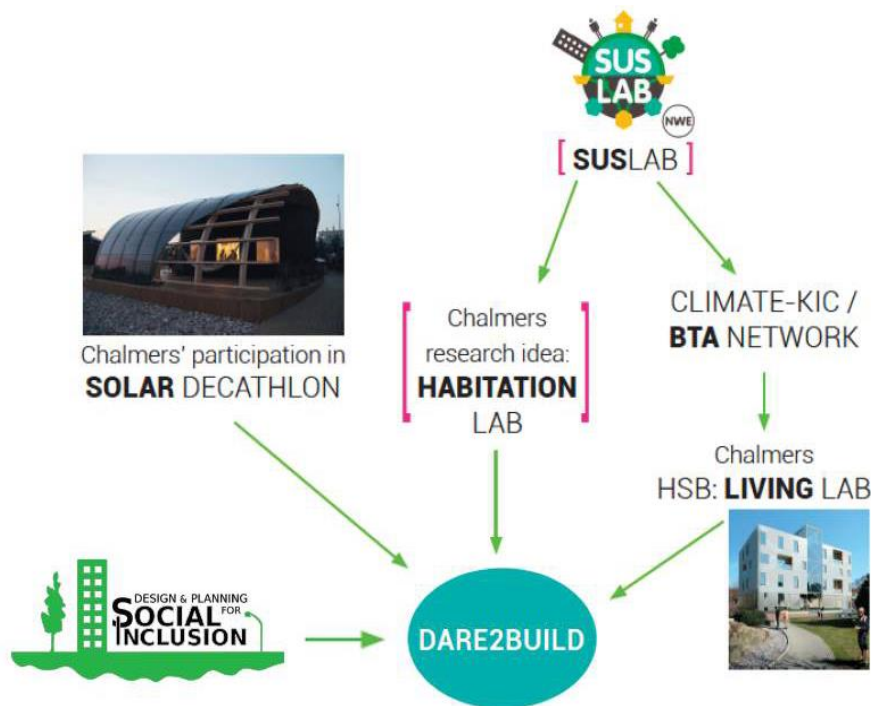


Figure 12 – Projects that originated and inspired the summer course Dare to Build (Hagy *et al.*, 2017)

The course stemmed from various experiences lived in Chalmers (Hagy *et al.*, 2017), such as:

- *SusLabNWE*, a European project offering an infrastructure of ‘Living Labs’ for the design and evaluation of technologies that support sustainable home practices (SusLabNWE, 2019);
- Chalmers’ *Habitation Lab* research, which consists of students creating their own living quarters environment;
- *Climate-KIC Building Technology Acceleration* flagship project, that spawned *HSB Living Lab*;

- The *Solar Decathlon* design and build project, which was an interdisciplinary project in Chalmers in 2013, that aimed for an energy solar home, to be shipped to China;
- The autumn semester course *Design and Planning for Social Inclusion* (DPSI), which was mentioned in the earlier section and which had produced several design and build projects since 2016.

This course was built around the idea that, currently, the industry is severely fragmented. While it demands collaborative working practices with multidisciplinary teams, the educational practice in the architecture, engineering and construction professions still remains siloed. Moreover, it remains with limited possibilities when it comes to practical or field projects. This results in an ill-equipment of current students for the demanding collaborative practices of today's building industry, and a persistent and systematic lack of information about the different disciplines, that consequently leads to frustration and lack of empathy in the work environment. As a response, it is advocated in this course that, in order to build a sustainable society, professionals must be able to communicate, collaborate and generate ideas together.

Moreover, the course aims to develop the necessary skills to engage with users and local stakeholders to create and build an environment that fosters social inclusion and addresses properly the local needs and issues, lifting them from theory to practice (Brandão *et al.*, 2019).

In order to achieve these goals, students engage in producing innovative designs, not only aesthetically speaking but also in terms of construction and sustainability, in collaboration among themselves and the relevant stakeholders.

The goals of this course are, in sum (Brandão and Hagy, 2019; Sasic and Hagy, 2019):

- Enhance the collaboration between engineers and architects;
- Create impact and outreach in communities through design;
- Develop relevant skills i.e. communication, design, problem-solving;
- Co-create a built result that addresses local needs as well as global issues;
- Bring all aspects of sustainability from theory into practice;
- Provide real context experience.

There are both common and different intended learning outcomes whether the students have an engineering or architecture background, as seen in Table 2.

Table 2 – Intended learning outcomes for Dare to Build (Brandão and Hagy, 2019; Sasic and Hagy, 2019)

COMMON
Be able to use the co-creation methodology to solve practice-based problems within the built environment;
Be able to work in multidisciplinary project teams, lead project work and present results throughout all phases of the CDIO process;
Be able to visualize and communicate different proposals in a professional way to classmates, clients, stakeholders and experts from different backgrounds and in different stages of the design-build process;
To motivate different proposals with reference to scientific, or experience-based, knowledge and value-based arguments
To combine knowledge from different disciplines and sectors in proposals for actions and measures in design for sustainable development;
To further develop critical thinking and reflections on the professional role, professional ethics and the needs for lifelong learning.
ENGINEERING
Describe and refer to different methods and approaches to integrated sustainable engineering design solutions;
Identify and explain the different practical implications of applied engineering design for a sustainable built environment;
Be able to develop a conceptual design and critically review, develop and implement technical solutions to solve engineering tasks in a multi-disciplinary team using a holistic, systematic approach;
Be able to apply engineering tools and methods from previous coursework into a real-world project.
ARCHITECTURE
Describe and refer to different methods and approaches to integrated sustainable architectural design solutions;
Identify and explain the different practical implications of applied architectural design for a sustainable built environment;
Identify and explain the structure of a project life cycle and the characteristics of each phase;
Be able to conduct an explorative project to design and assess concrete proposals and solutions in a multidisciplinary team of building-designers
Be able to apply architectural design tools and methods from previous coursework into a real-world project;
Be able to design and assess concrete architectural design proposals and solutions for local sustainable development.

The structure of the course also revolves around the motto *tune-in* and *build*, following the CDIO framework — *conceive, design, implement, operate* (CDIO, 2019).

The timeline of Dare to Build starts with the aftermath of DPSI, with two workshops taking place in April and May, aimed to meet the people involved and to brainstorm some possible design ideas, as well as make ground organisational and delimitating decisions.

The course officially starts at the beginning of June, with a full week of intensive design and prototyping, lectures.

In the following three weeks, students build on-site and learn about learning techniques, site management and real-time problem-solving. The project should be implemented by the end of this period.

The week that follows is destined for individual assignments, to be carried out after the building phase, which consists of personal reflections about the project process and outcomes and a literature review mainly on the subject of collaborations between architects and engineers.

As described in the course description document, evaluation is practised through students' examination. In order to pass the course, the following is required (Brandão *et al.*, 2019):

- Attendance and active participation at lectures/seminars
- Active participation in group work, presentations and cross critics
- Delivery of course assignments of sufficient quality (fulfilling the requirements regarding content and presentation of the assignments)
- Attendance and active participation in the construction of the building

There are also compulsory (individual and group) assignments structured and examined as follows:

- A decision-making manifesto (group);
- A material list and budget (group);
- A detailed schedule including daily tasks, milestones and links between specific tasks (group);
- Descriptive drawings for what to build, including plans, sections, elevations, and details (group);
- A literature review relevant to the project theme (individual);
- A written critical reflection about the student's experience and learning process (individual);

The project itself is evaluated through these critical reflections made by students.

As both the DPSI and D2B courses work in the Swedish Million Homes Program areas, it is relevant for this research to describe in what this program consists.

4.1.1.3. Swedish Million Homes Program

The Million Homes Program (MHP) marked numerous residential zones in Swedish cities, built between 1965 and 1974, one of them being Siriusgatan in Western Bergsjön.

This program was established in the hopes of accommodating an estimated influx of domestic migration, due to the growing prosperity in the cities and consequent demand for housing. To end this housing shortage, the Swedish government decided for the subvention of the edification of a million new dwellings in a period of 10 years, which led to the name Million Homes Program.

When the construction of these dwellings reached halfway, the housing shortage was replaced by a housing surplus, due to the rapid expansion of the housing stock and also due to the shift from economic growth to economic stagnation (Hall and Vidén, 2005). The housing surplus led to a significant reduction in rents pricing, attracting low-income residents.

These areas had to adapt to the subsequent periods of mass immigration. Also, over the last few years, many have come as refugees, from e.g. Chile, Bosnia, Somalia and now the Middle East. Today, some of these areas receive an intense connotation of segregated, marginalised housing areas.

Many regional and national projects have bloomed in an attempt to increase resilience and social welfare among its residents. Housing companies have made efforts through the means of local projects and overall management, that are mainly focused on a resident-orientated approach. Despite the efforts, some of the interventions have brought very little significance for the ones they were meant for. The top-down approach is evident in certain measures applied, showing a lack of local community planning.

A problem that seems to persist with most of the larger housing companies and their respective MHP estates is the consistent neglect when it comes to maintenance. Major works in the renovation are massively opposed by the ones who reside there, as it would increase the value and rents of these properties and the residents would not be able to afford them.

It is pertinent to understand generally the built environment and the land use of these areas, namely the area of *Siriusgatan*, which is where the D2B project was implemented.

4.1.1.4. Built environment and land use

The area of *Bergsjön* was, for the most part, built between the 1960s and 1970s. Most of these buildings were built under the MHP.

Data from the City of Gothenburg shows that 73% of the housing in the neighbourhood which *Siriusgatan* is part of was built in the period 1961 to 1970, 22,1% between 1971 to 1980, and the remaining 4,9% in other years from 1940 onward.

The dwelling units are disseminated with forests in between, e.g. *Gärdsås Mosse*. They are connected by bicycle paths and walkways. The area consists mostly of large apartment blocks, where the case of *Siriusgatan* is included.

Familjebostäder, a city-owned housing company, owns 12 buildings divided into 1200 apartments with approximately 3040 tenants at *Siriusgatan*. The buildings are 6-8 stories high, complemented with lower car-park buildings. *Siriusgatan* is located 10 kilometres away from the city centre of Gothenburg.

The equipment found in the buildings and their apartments is dated to when the buildings were built. There are a number of technical problems that can be found in these buildings, such as frequent leaks, lack of proper insulation, moisture in the outer walls, etc. There is hesitancy when it comes to improving these conditions because in most cases it would mean that rents would need to be raised. Consequently, the current tenants would not be able to afford them.

Gärdsås Mosse (or *Gärdsås raised bog*) represents an important green area of this neighbourhood, with biodiversity that accommodates both cultivars, pastures and dense forests as well as marshes and wetlands. There are walkways, cultivation lots and wetland parts with amphibians. A deciduous forest area has been developed freely to increase the availability of deadwood, which among other things favours insects and birds (Göteborg Stad, 2019).

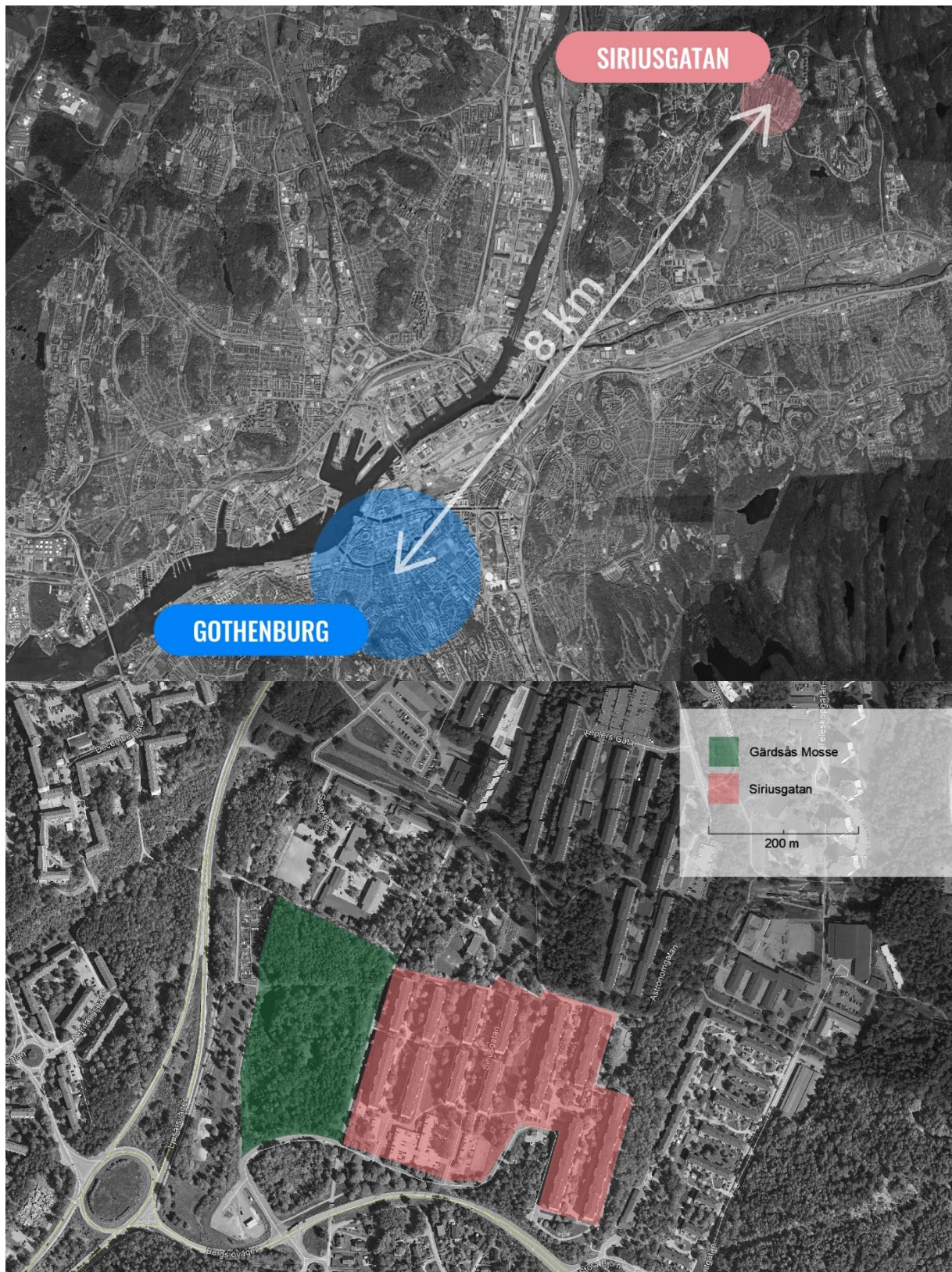


Figure 13 – *Siriusgatan* and *Gärdås Mosse* in Western *Bergsjön*, relatively to the centre of Gothenburg

4.1.1.5. Socio-economic context

Table 3 – Statistics for the residents from Western *Bergsjön* compared to Gothenburg (Göteborg Stad, 2019).

		Western <i>Bergsjön</i>	Gothenburg
Inhabitants		7972	564 039
Age	0-5	10,7%	7,3%
	6-9	5,2%	4,6%
	10-15	6,4%	6,1%
	16-18	3,1%	2,8%
	19-29	19,8%	18%
	30-44	24,2%	23,1%
	45-64	20,1%	22,7%
	65	10,5%	15,4%
Average yearly income		187 100 SEK	297 300 SEK
Born abroad		54,6%	26,1%
Education level	Lower than high school	24,3%	10,8%
	Higher education	17,8%	35,2%
Unemployment		13,4%	5,6%
Among born abroad		17,6%	11,6%
Among born in Sweden		4,9%	2,8%

Western *Bergsjön* shows similar characteristics to many suburb MHP areas. A majority of its population was born abroad (54,6%) of which 17,6% are unemployed. These numbers are much higher than the ones seen in the city of Gothenburg as a whole (Table 3). The average yearly income of a resident of Western *Bergsjön* is 187.100 SEK (around 17.500 Euros in 2019), much lower than the average resident in the city of Gothenburg (297.300 SEK which is approximately 27.800 Euros in 2019).

Since rents are low in these residential areas, these properties become attractive to lower-income families, often from foreign origin, catalyzing segregation and consequent neglect compared to other areas of the city.

The target group of the project at hand in the pilot study is children between the ages of 6 to 9 years old, a minority in Western *Bergsjön*, representing approximately 5% of its population. Regardless, it is no less important to take action and create spaces for children in these often-forsaken areas.

4.1.2. PROJECT DESCRIPTION

4.1.2.1. Background

The Dare to Build 2018/2019 project took place in Western *Bergsjön*, a suburb in northeastern Gothenburg. More precisely, the project was implemented in a forest area called *Gärdsås Mosse*, adjacent to Siriusgatan, an area built under the Swedish Million Homes Program, as described in earlier sections.

Gärdsås Mosse had fallen into disrepair, its waters became polluted and rumours circulated in the neighbourhood about the area being unsafe. A group of students from the DPSI autumn course 2018, through their studio project, worked and collaborated with the community children to understand what could be done to rehabilitate this area.

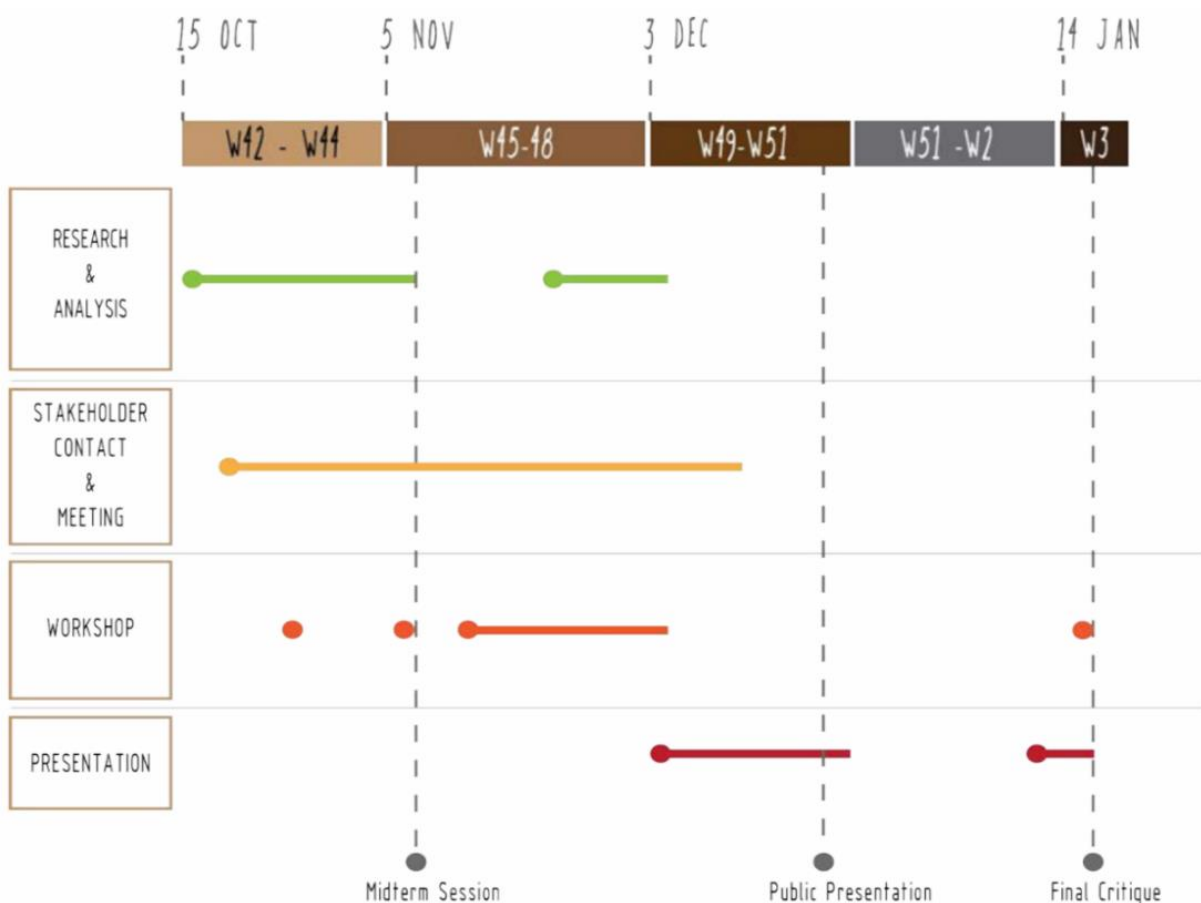


Figure 14 – DPSI Group 3 project timeline (McCrea *et al.*, 2018)

The timeline of the project at hand has consisted of four overlapping stages: research and analysis, stakeholder contact and meetings, workshops and presentation with three events happening through it: a midterm session, a public presentation and the final critique.

For the first workshop, on November 22nd, 2018 a group of second-grade students from *Gärdsåsmosseskolan* and four teachers have participated (McCrea *et al.*, 2018). They were split into

groups and each group was assigned a character and given appropriate masks: The Woodpecker, the Mushroom, the Plants, the Frog and the Wilderness — all of them being species native to that forest. With the supervision of a teacher, the children were invited to be part of a roleplay, where they would find and trace a storytelling path for each creature. The result was a combination of four paths, in which could be observed a number of intersections.

The second workshop happened on December 4th, 2018 (McCrea *et al.*, 2018). The children were invited to design each of the six path intersections with different materials such as twigs, sticks, string, rubber bands, nails and pins in previously prepared boards. At the end of this workshop, the children were handed wax figures which represented themselves as users of these spaces. As they laid these figures in different places, they described what activities they would be doing there. The results were analysed and conclusions were drawn for the final designs.

This project proved to be a learning experience for the students when it comes to ways of communicating design plans and drawings to people — to children in this specific case — in a more tailored manner.

One of the resulting spaces, the Storytelling Circle, has been selected to be built in the Dare to Build summer course, in the heart of the forest. The circle is the point where all paths and all creatures meet, intended to be made of natural elements such as wood and to be slightly elevated from the ground.

4.1.2.2. Main goal

Following up the DPSI group project, the main goal of the Dare to Build 2018/19 project is to “design and build a forest integrated learning structure” where enrolled students can “develop and apply their design and engineering skills to realize a creative hub where children can learn and experience the wonders of nature” (Hagy *et al.*, 2019).

The main goal of this project was to create an outdoor storytelling space that emphasizes the nature of the area, as a resource and opportunity for children and the neighbouring community to learn more about the nature that surrounds them. By blurring the lines between humans and nature, the design and construction itself were used as a teaching tool to inspire the next generation of environmentalists. This space shall not only accommodate the teachers and children of the neighbourhood but also welcome the species that inhabit this forest.

The main design principles followed were (Hagy *et al.*, 2019):

- Biomimicry, inspired by the five characters, and use of natural materials where possible;
- Emphasis on the use of joinery and transition between the use of different materials for construction;
- Child and animal-friendly design solutions;
- Application of a collaborative design process between architects, engineers, the client, and public users.

4.1.2.3. Design aspects and success criteria

The project as a whole is deemed to be successful if (Hagy *et al.*, 2019):

- The project is completed in the allocated time and budget;
- Construction materials are mostly natural and reusable materials;
- If students from both engineering and architecture work together;
- Conforms to all safety regulations;
- All five characters are represented in the final design and construction.
- A survey identifies that the space is being used and appreciated (by the students, teachers, families and community members) against the initial needs' assessment for the project;
- If visitors of all ages from outside the community also use the space and learn something by being there: exploring the area and enjoying the space;
- The design remains functional as the project ages. This includes the effects of the natural environment on the materials used for construction.

The expected outdoor storytelling space was divided into five different elements corresponding to the five characters that inhabit the forest: woodpeckers, mushroom, frogs, plants and the wilderness as a whole, each one of these elements had design aspects and criteria of their own. Each one of these elements had specific aspects and design criteria to be followed (Table 4).

Table 4 – Aspects and design criteria of design sub-groups (Hagy *et al.*, 2019)

CHARACTER	PATH	CIRCLE
WOODPECKER	<p>Path up in the air;</p> <p>Perching from tree to tree, find tree connections;</p> <p>Work with creating sounds. (use the pecking behaviour of the woodpecker as a tool and an inspiration)</p> <p>Materials may include; hollow logs, twigs, a connection between the woodpecker and the rest of the creatures</p>	<p>The floor makes different sound experiences. (stepping on hollowed logs, leaves, etc.)</p> <p>The habitat of the woodpecker is presented in the seating places, through a focus on height or nesting or other features of the habitat.</p> <p>Use biomimicry inspired by the woodpecker for structure design</p>
MUSHROOM	<p>Define the path with objects that create opportunities for mushroom growth. (posts, rope, etc.)</p> <p>Incorporate objects that provide shade and collect moisture.</p> <p>The path should be designed with wheelchair and elderly accessibility in mind (could be earth and gravel).</p> <p>Include a Handrail structure.</p>	<p>The path joins the circle with a ramp.</p> <p>The circle can provide openings to observe the shaded area under the circle as it is optimal for mushroom growth. (a suspended rope net over a mushroom growth, hammock).</p> <p>Use biomimicry inspired by the mushroom for structure design.</p>

<p>PLANTS</p>	<p>Good soil and sunshine for plants to grow and take over the path.</p> <p>Define the path on ground and tree stem level.</p> <p>Use mud and rocks to create special formations that can still be identified even after plants grow on the path.</p>	<p>Use Visual elements to define the plant spaces on the circle; maybe through using colours or contrasting materials.</p> <p>Create a place for the plants to grow on, as part of the circle.</p> <p>Use biomimicry inspired by plants for structure design.</p>
<p>FROG</p>	<p>Use logs to create a 'hopping trail'.</p> <p>Hopping trail in a safe distance from the water and can seem to continue on the other side.</p> <p>Work with creating movement. (use the hopping behaviour of the frogs as inspiration).</p>	<p>The frog on the circle is represented in seating like the hopping trail elements that seem to continue in the circle and encourage stillness after movement</p> <p>Create a place for natural puddles to form.</p> <p>Provide habitats for the frogs in the design of the underlying structure.</p> <p>Use biomimicry inspired by the frog for structure design.</p>
<p>WILDERNESS</p>	<p>It watches over every path, making sure nature is allowed to cross and take over each one.</p> <p>It ensures the circle, structure and elements, are made with natural materials; mud, twigs and leaves and anything else naturally occurring in the forest.</p> <p>It makes sure habitats are created for the creatures of the forest.</p> <p>The visual and acoustic nature of the forest is sustained.</p> <p>It creates the connections between all the creatures on the circle.</p> <p>It created a natural portal for the kids, scaled to their height and blended in nature.</p>	

4.1.2.4. Timeline and schedule

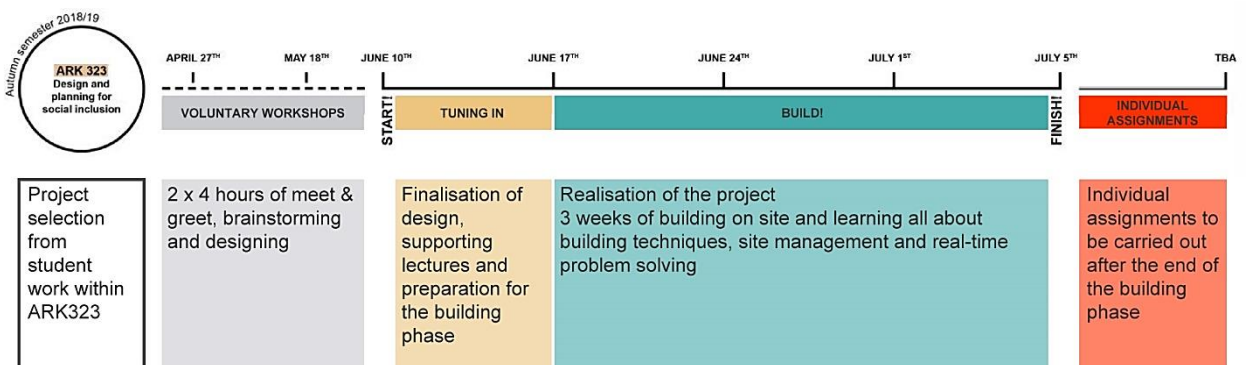


Figure 15 – The estimated timeline for Dare to Build 2019 (Hagy *et al.*, 2019)

The timeline of Dare to Build starts with the aftermath of the autumn course Design and Planning for Social Inclusion, with two workshops taking place in April and May, aimed to meet the people involved and to brainstorm some possible design ideas. The overall time constraints for this year’s project can be seen in Table 5.

Table 5 – Time constraints for Dare to Build 2019 (Hagy *et al.*, 2019)

TASK	MILESTONE
Approvals from local authority	23 rd May 2019
Project planning and design completion	15 th June 2019
Execution	17 th June 2019
Completion	5 th July 2019

The course officially started at the beginning of June, with a full week of intensive design and prototyping, lectures and the necessary literature review.

	10-juni	11-juni	12-juni	13-juni	14-juni
08.00-08.30	Welcome (HK)	CHECK-IN/DAY PLAN	CHECK-IN/DAY PLAN	CHECK-IN/DAY PLAN	CHECK-IN/DAY PLAN
08.30-09.30	Introductions and course info, deliverables, communication (HK)	LECTURE: Child-friendly design (HK)	LECTURE: Design and Post Humanism (HK)	Travel to Site & Pack tools	Team Tutorials & PROJECT WORK
09.30-9.45	FIKA/BREAK	FIKA/BREAK	FIKA/BREAK	FIKA/BREAK	FIKA/BREAK
9.45-10.45	Project Background (HK)	PROJECT WORK: design teams (HK)	PROJECT WORK: design teams (HK)	MOVE TOOLS and logs to SITE (SITE)	evaluation workshop presentation
	GROUP Formation and roles (HK)			MOVE TOOLS and logs to SITE (SITE)	PROJECT WORK: design teams , dwgs, budget, schedule (SITE or HK)
10.45-11.45	1st Impression Design Sketch Workshop (HK)	PROJECT WORK: design teams (HK)	PROJECT WORK: design teams (SITE or HK)	MOVE TOOLS and logs to SITE (SITE)	PROJECT WORK: design teams , dwgs, budget, schedule (SITE or HK)
11.45-12.45	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH
12.45-13.45	LECTURE: collaborating across boundaries	PROJECT WORK: design teams (HK)	PROJECT WORK: design teams (HK)	Set-up Site and Tool Container (SITE)	PROJECT WORK: design teams , dwgs, budget, schedule (SITE or HK)
13.45-14.45	Travel to Site	Team Tutorials & Project work	Material lists and ordering	Set-up Site and Tool Container (SITE)	PROJECT WORK: design teams , dwgs, budget, schedule (SITE or HK)
14.45-15.00	NO FIKA	FIKA/BREAK	FIKA/BREAK	FIKA/BREAK	FIKA/BREAK
15.00-16.00	SITE visit & stakeholders understanding site mapping exercise (SITE)	WORKSHOP: Decision making Manifesto (HK)	LECTURE: Understanding Wood-Structure, Durability and Joints	WORKSHOP: safety (SITE)	dwg, budget, schedule hand-in-Post up
16.00-16.45	PROTOTYPING on-site: Stage 1 (SITE)	GROUP Discussion: Sketch & idea presentations (HK)	WORKSHOP: Joints	PROTOTYPING on-site: Stage 2 (SITE)	GROUP Discussion: Hand-in review and next week planning (HK)
16.45-17-15	Discussion and Wrap-up	Clean-up/Wrap-up	WORKSHOP: Joints	Clean-up/Wrap-up	Clean-up/Wrap-up

Figure 16 – Schedule of the first week of Dare to Build (Hagy *et al.*, 2019)

The schedule was purposefully flexible in order to better address the design plans and needs. The workflow of the first week consisted mainly of group work: five groups were formed, based on the five characters, to better respond to the design criteria of each one of them. Each group chose one member to represent them in the Design and Planning Coordination Team. This team had to coordinate and plan the various activities between the five groups and combine the various outputs of each one of them, as well as set drawings, budget draft, schedule and shopping lists.

In the subsequent three weeks, participants (see section 4.1.3.2.), with the supervision of teachers and tutors, built the projected elements and learn about building techniques, site management and real-time problem-solving. The schedule for the three weeks of building on-site will be based on the design and planning work done during the first week. The workflow for these weeks was managed by a Daily Coordination Team (DCT) in collaboration with the teaching team. In order to create these DCTs, each student during the first week signed up for a specific role on the DCT. These are (Brandão *et al.*, 2019):

- Project Manager
- Site Supervisor
- Safety and Efficiency Officer
- Communications Officer
- Food and Fika Responsible

By the end of the three weeks of the implementation period, the designed structures were required to be in place.

The following and last week was intended for students to work on individual assignments, carried out after the building phase, which consisted of personal reflections about the project process and outcomes.

4.1.3. STAKEHOLDERS

There were multiple entities involved during the DPSI and D2B courses, but only a specific set of them was influenced directly by this project. The DPSI group project (which concerned a co-creation cycle of a design project – co-initiation, co-production, co-evaluation) envisioned a participatory process with the children and creatures of *Gärdsås Mosse*. D2B, on the other hand, foresees a co-creative process focused on co-implementation among students from different fields and teachers, to make the DPSI project come to life.

In the project carried out in the D2B course, the stakeholders are Chalmers University, the course participants (Chalmers and Rice students and summer workers), COWI and *Park och Natur*. There is representation from different sectors: academia is mostly represented in the participants and teachers, and civil society is represented in this case by the summer workers. *Park och Natur* represents the public sector and COWI the private.

The stakeholders change from DPSI to D2B, as shown in Table 6. Their connection to the project is described in the next sections.

Table 6 – Overview of the entities involved in this project, both in DPSI and D2B.

DPSI	D2B
Children of <i>Gårdsmosseskolan</i>	Chalmers University of Technology
Creatures of <i>Gärdsås Mosse</i>	Participants (students + summer workers)
Chalmers students	COWI
Chalmers teachers	<i>Park och Natur</i>
COWI	
<i>Park och Natur</i>	

4.1.3.1 Chalmers University of Technology

Chalmers University of Technology, located in Gothenburg, Sweden, focuses on research and education in many areas, including civil engineering and architecture.

The Department of Architecture and Civil Engineering (ACE) is a merger of the former Department of Architecture and Department of Civil and Environmental Engineering. The reason behind this merger is that different perspectives should enable strong interdisciplinary development and to address the different aspects of sustainability.

This merger challenged some of the master programs taught in this department, in which students from architecture and engineering can enrol. Some of the programs focus to give these students adequate skills and methods in situations of change in which design is required. Students are expected to learn how to find solutions which support sustainable development in a variety of contexts.

For instance, the Architecture and Planning Beyond Sustainability (MPDSD) program is sustained by design studios that handle real situations in close contact with stakeholders and actors. Students come from different backgrounds within the fields of architecture, interior architecture and urban and spatial planning. The educational approach revolves around developing students' design skills through a number of design studios while dealing with complex design tasks in very different situations and contexts—such as neighbourhoods and municipalities in Sweden, informal settlements in the global south—and technical and social challenges of sustainable building and transformation. The design studios hold experience-based learning, fieldwork, tailored lectures, literature studies, seminars, workshops, design project work, and exhibitions.

With this vision in mind, ACE launched the new and innovative voluntary course in 2018, Dare to Build (as described in section 4.1.1.2). It is aimed to be a learning platform to enhance the collaboration between engineers and architects while at the same time creating impact and outreach in communities while offering students complex challenges embedded in society and guiding them to implement their strategies.

4.1.3.2 Participants

Chalmers students

The fifteen students enrolled in this course (which technically is two courses – *ACE135 D2B* for architects and *ACE160 D2B* for engineers, sharing the same course project management and assignments) come from different backgrounds, namely architecture and engineering. As described before, apart from having expected learning outcomes that are common to all students, students have learning outcomes dedicated to their field of study. Despite coming from different backgrounds and countries, all students are studying in a master program.

Rice students

William Marsh Rice University, commonly called Rice University is a private research university with an undergraduate focus. It is located in Houston, Texas in the United States.

Amidst a collaboration between Chalmers and Rice University, a group of seven bachelor level students from different engineering fields had the opportunity to integrate the project's participants, both in the production and implementation phases.

***Familjebostäder* summer workers**

Familjebostäder i Göteborg (from now on referred to as *Familjebostäder*) is a city/municipality owned housing company in Gothenburg, Sweden, founded in the 1950s. It is wholly owned by the City of Gothenburg. *Familjebostäder* owns about 18.000 residential apartments located in the city of Gothenburg where the demand is rather significant. It also operates to a lesser degree in the market of commercial properties, a segment where they own about 960 premises, which they rent out to shops, grocery stores and other public organisations, etc. (*Familjebostäder i Göteborg*, 2016).

Every year, *Familjebostäder* has a program committed to employing high school students during the summer period. Eight of these students integrated this year's Dare to Build project, integrating the participants, whilst being paid.

4.1.3.3. Park- och Naturförvaltningen

Park- och Naturförvaltningen (from now on referred to as *Park och Natur*) stands for Park and Nature Management, which is one of the 21 special administration offices of the City of Gothenburg (*Göteborgs Stad*). It manages and develops Gothenburg's parks, squares, streets, sculptures, natural areas, trees, playgrounds, bathing areas and public toilets. Moreover, it is also responsible for many lakes, canals and cleaning along the coasts of the city. This administration coordinates and runs various labour market projects, manages parking machines and it is responsible for the winter road management on the municipality's public roads. The most well-known task of the *Park och Natur* is to manage *Slottsskogen* and *Trädgårdsföreningen*, which are two important green areas in Gothenburg.

Nearly 350 people work under *Park och Natur*. As the description above suggests, the employees' tasks are many and varied - from clearing the city's channels to building exercise tracks and arranging playgrounds.

Park och Natur launched a recovery project for the area of *Gärdsås Mosse*, that fell in decay for the last few years. The aim of this project is to clear the green surfaces, build walkways and bridges and provide one main stretch of lighting. To level the existent wetland park, which was built in the 1990s and to create cultivation lots as well as an outdoor learning space were also included in the project plans (Bergsjon 2021, 2018).

COWI AB (which is described in the section below) was selected to lead and execute the *Gärdsås Mosse* project.

4.1.3.4. COWI

COWI AB is an engineering consultancy company with headquarters in Gothenburg, concentrating in community building, technology development, project management and environmental technology.

COWI provides a range of services for managing and improving areas with natural resources and for restoring wetlands, forests and other natural areas.

For this project, a partnership was established between COWI and Chalmers University of Technology with the aim of delegating the design and construction of the outdoor learning environment. This project was then proposed to students of the DPSI course since it deals with small urban interventions in the Swedish MHP areas.

4.1.3.5. Children of Gärds mosseskolan

Gärds mosseskolan is a public elementary school that comprises students from the 1st until the 6th school years. The children of this school had a fundamental role in shaping this project during the DPSI course, as previously described. The children attending this school, and the ones that are part of the nearby community, are the target group of this project.

4.1.3.6. Creatures of Gärdsås Mosse

The characters chosen to be the main protagonists of the imaginary thought by the DPSI students are the wild creatures that live, in fact, in *Gärdsås Mosse*. The project revolves around the environment and its inhabiting creatures — mushrooms, frogs, woodpeckers and plants.

Being often forgotten as a stakeholder, nature and living beings are in focus in this collaborative project.

4.2. FRAMEWORK APPLICATION

In order to assess the partial validity of the presented framework, a pilot study was performed. The next sections describe what and how it was applied. The results are made explicit and further analysed. Finally, a discussion is presented, to conclude upon the results.

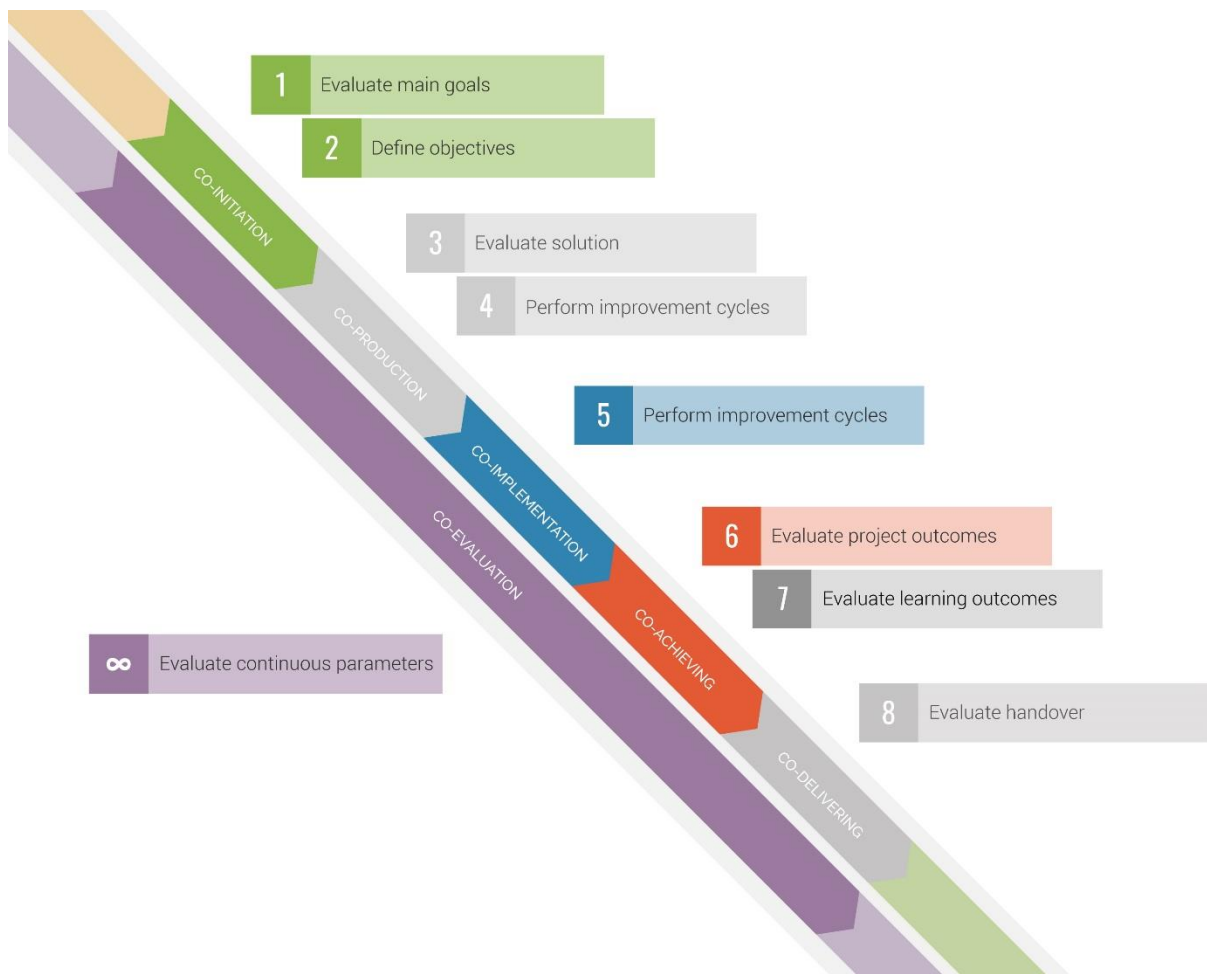


Figure 17 — Planned process for the application of CO-VALUE

The framework application consisted of five different instances, corresponding to six different stages of the co-evaluation framework.

The first instance consisted of an online form with the purpose of evaluating the main goal (Appendix B), which is the first step of the co-evaluation framework presented in this research. The proposed questions were based on the twelve evaluation parameters, part of the framework.

For the second instance, the framework's second step *Define objectives* was implemented through a workshop (Appendix C). Specifically, the type of objectives to be set were the ones pertaining to the *project*.

As for the third instance, a daily evaluation was implemented during the construction phase of the project, through an online form (Appendix A). The survey questions were based on ten out of twelve of the evaluation parameters. In the same survey, the fulfilment of the learning objectives (that align with the course's intended learning outcomes) was daily assessed.

A midterm evaluation was conducted with the goal of performing an assessment of the fulfilment of the project objectives and decide upon a course of action for each one of them.

The objectives defined in the second instance were to be assessed in a fifth instance, that corresponds to the *Evaluate project outcomes* stage of the framework (Appendix E). Due to some delay in the construction phase of the project, the last workshop could not be delivered.

Due to the limited time, only four out of five phases and 6 out of 8 stages were tested.

4.2.1. REPORT

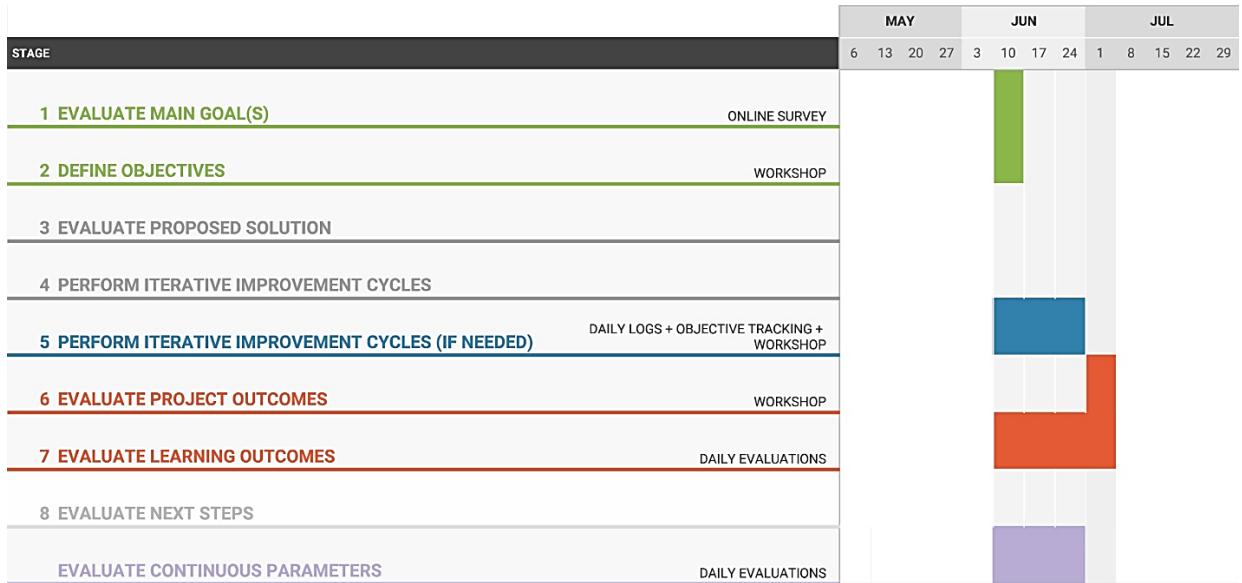


Figure 18 — Timeline of the implemented parts of the presented co-evaluation framework

4.2.1.1. Evaluate the continuous parameters (Stage 0)

Daily Evaluations



Figure 19 — A QR code linked to the online form was displayed on site, for easy access.

In order to perform a continuous evaluation, a daily evaluation online form was prepared (Appendix A). The purpose was to evaluate continuously the 10 out of the 12 parameters, every day during the three weeks of the co-implementation phase. Additionally, the learning objectives (i.e. course's expected abilities and skills) were also assessed in the same manner, asking students from Chalmers how much they have developed each one of them daily.

Participants were asked to fill it in starting from the end of one day till noon of the next day. The online form was meant to be simple and quick to fill in, relying solely on rating and closed questions. These were:

Table 7 — Daily Evaluations, survey questions

PARAMETERS	QUESTIONS	TYPE
CAPACITY BUILDING	<i>Were you given the knowledge and skills you need to perform the tasks you were assigned today?</i>	Rating (1-5)
DIRECTION	<i>Was it clear to you what tasks you had to perform today? Did you always know what to do?</i>	Rating (1-5)
INCLUSION	<i>Was there any involvement from the community and other actors in the work performed today?</i>	Yes/No
KNOWLEDGE	<i>Was the knowledge from the various stakeholders taken into consideration for the tasks you performed today?</i>	Yes/No
ITERATITIVITY	<i>Have you had the opportunity to trace back to some mistakes done and make an improvement today?</i>	Rating (1-5)
OWNERSHIP	<i>Do you feel any ownership for the work you have performed today?</i>	Rating (1-5)
SUPPORT	<i>How much support were you given to perform the tasks you were assigned today?</i>	Rating (1-5)
COMMUNICATION	<i>Did you communicate with any of the listed stakeholders today?</i>	Yes/No
ALTERATIONS AND DEVIATIONS	<i>Were there any changes to plans today?</i>	Yes/No

The results were sent to the teaching team weekly, for their own assessment. In order to prevent any bias from the answers provided, the weekly results were not shared with the participants. They can be seen in Appendix A.

Although the survey was short and with no open questions, there was a constant need to remind students to fill in the form. Students remarked that it was repetitive, which led to sometimes not paying full attention nor reflecting upon their answers. It was deemed that students should not be able to see their own results, in order to not enable a bias in the results, but due to this fact, the results of the survey conveyed little meaning for the students themselves. Seeing no actual personal purpose for filling the form led to fewer answers than expected, even more so towards the end of the course, when there were delays in the construction phase.

4.2.1.2. Evaluate the main goal (Stage 1)

The purpose of this evaluation was to assess the first impressions and expectations from different stakeholders — in this case, students and teachers — as well as the pertinence of the project’s main goal, with the help of some of the evaluation parameters.

An online form was done in the Google Forms platform (see Appendix B). This form contained questions that pertain to the parameters Direction, Appropriateness, Acceptability, Capacity Building and Support because they were parameters that better concerned this phase of the project. The questions were the following:

Table 8 — Evaluating the main goal, survey questions

PARAMETERS	QUESTIONS	TYPE
DIRECTION	How clear to you the main goal of this project?	Rating (1-5)
	How clear to you is the connection between the main goal and the project itself?	
APPROPRIATENESS	How relevant do you think this project is for this context?	Rating (1-5)
ACCEPTABILITY	How much do you look forward to the changes that this project will lead to?	Rating (1-5)
CAPACITY BUILDING	In your opinion, what knowledge and skills do you need to put this project into place?	Open
	Pick one skill or knowledge that you would like to improve during this project.	
SUPPORT	How much information have you been given about what is expected of you?	Rating (1-5)

Each survey question had one open inquiry associated with it, asking the participants to elaborate on their previous closed answers.

The results (as can be seen in Appendix B) were meant to give the teaching team an overview of the students’ and summer workers’ perception and opinion regarding the project after the first week of the course, pertaining to the design phase. The non-response ratio was low (23 out of the 26 present, corresponding to 12% of non-response).

It was pointed out by one of the teachers that the questions posed must be as clear as possible, in order to avoid misunderstandings in the results.

4.2.1.3. Define project objectives (Stage 2)



Figure 20 — Participants gathered during the morning brief, prior to the evaluation workshop

In order to *define project objectives*, a workshop took place on June 13th, 2019 with Chalmers and RICE students, the Chalmers teaching team and the *Familjebostäder* summer workers.

The research was presented to the participants, followed by an explanation of the SMART criteria. The participants were then split into groups of 4 and 5 people. Each one of these groups was handed an A3 sheet divided into five columns, each one corresponding to a SMART criterion (see Appendix C). In this sheet, the participants had to write a number of objectives (at least one, at most three) for the project in general, not only for their own design teams. The objectives were prioritised through a small voting session — each participant had to choose five objectives.

After the workshop, the objectives proposed were clustered and merged. A list of seven objectives resulted from this final exercise (see Appendix C). All of these seven objectives were mentioned somehow in the project brief written by the Chalmers teaching team alongside with the DPSI student group that worked on this project idea.

4.2.1.4. Perform iterative improvement cycles (Stage 5)

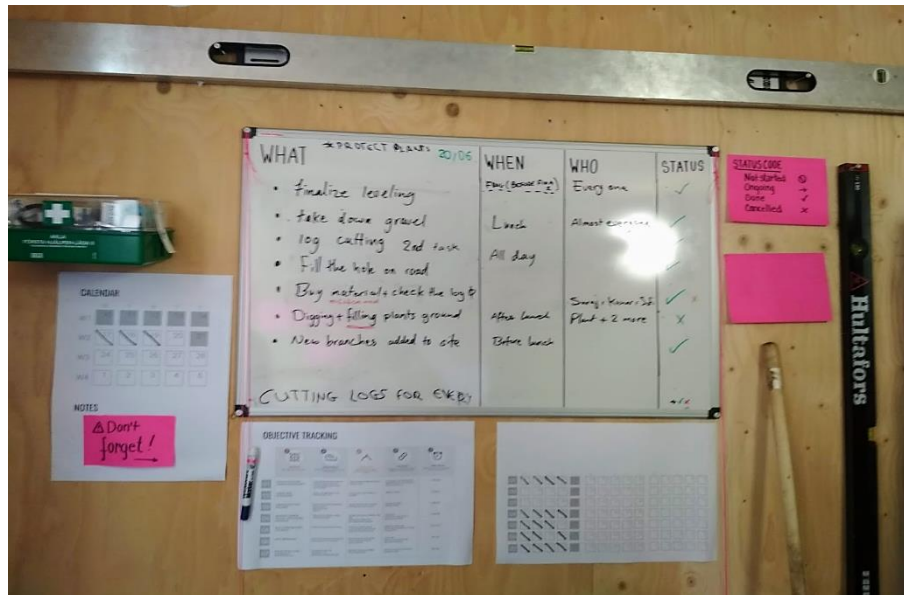
Objective Tracking

Figure 21 — The objectives were displayed until a whiteboard that was used for a general daily log.

The objectives defined in the second instance were displayed on the site, alongside a calendar of the three weeks of the construction phase (see Appendix C). Students were asked to cross the corresponding day in the calendar for each objective they have performed a task that would contribute to its fulfilment.

Daily Logs

As described in earlier sections, the project at hand gave the opportunity for students to be part of a daily coordination team. At the beginning of the course, students assigned themselves to each one of the five responsibilities set by the teaching team, for a number of days.

In order to support the daily planning and for the sake of recording the daily activities for the next daily coordination teams' knowledge, four different types of daily logs were created (Appendix D): a general daily log for the project planning, aimed at the Project Manager and Site Supervisor, a daily log for the Communications Officer and the Food and Fika Responsibles respectively, and a safety log where the Safety and Efficiency Officer recorded any risk behaviours and practices as well as injuries. Moreover, it allowed students to be aware of what was done and how much time was spent on it.

Since the daily activities were systematically logged, this enabled a continuous knowledge transfer among the coordination team, that was changing daily. Moreover, as tasks and their status were constantly updated, this enabled a daily assessment on what activities to perform, whether it was worth spending time in a certain task or not, resulting in the iterative process meant for this stage.

It was essential for students to be as clear as possible while filling these logs, otherwise, it could lead to misinterpretations. Regardless, as the names of those who coordinated the team for the day were listed in each log, they could be easily approached for any clarifications.



Figure 22 — The daily logs were kept in a folder, accessible to all participants.

Midterm Evaluation



Figure 23 — Midterm evaluation workshop, during the presentation of the groups' outcomes

A workshop that took place on June 27th, 2019 served as a midway check for the state of the project. On a first stage, they were asked to write down individually for each objective the tasks that were done, ongoing and the ones that were yet to be done by the time of the workshop. After this, students and teachers were divided into groups and they were assigned an objective. The groups were asked to write a course of action for each objective, based on what was listed.

This exercise allowed the participants to get an overview of the work done by every character team to achieve each one of the objectives and to decide upon a course of action for the following week.

Since a number of students (from Rice University) were leaving the course by the end of the week, this exercise also served for them to leave some final considerations about the work still yet to be done.

This exercise enabled a recap of what was done, to trace back to some issues encountered and to set a course of action based on these considerations. The information gathered was made available for the following coordination teams.

4.2.1.5. Evaluate project outcomes (Stage 6)

To apply this stage of the framework, a workshop was planned in order to do a final fulfilment assessment of the objectives that were set at the beginning of the project, and that were reckoned to be achieved by the last day of the construction phase.

Five different sheets pertaining to each objective was displayed in tables (Appendix E). In front of each listed measurable criterion, there are two drawn boxes, with the labels ✓ and ✗, associated with green and red post-its respectively.

Participants and teachers were asked to go around the tables and make deliberations about the fulfilment of each one of these measurable criteria. If they believed a criterion was fulfilled, they would take a green post-it, and write on it why they believe it was fulfilled. It would be necessary perhaps that they specified their building team.

After that, participants and teachers were divided through 5 groups, and they were assigned one objective. Groups were asked to write their final considerations about the fulfilment of the objective. A post-it with the colour green, yellow or red would be placed on the appropriate box, as can be seen in Appendix E. The group would comment on their judgment and write down some bullet points in the bottom left box. As for the two other boxes (centre and right), participants and teacher should enumerate some:

- **Positive Takeaways (+)**, things that were positive about the work on this objective, even if it was not fulfilled.
- **Improvement Takeaways (Δ)**, things that could have been changed or improved during the project, concerning the objective at hand.

To conclude, participants were asked to present their outcomes.

As mentioned above, the workshop did not take place, as the construction was delayed, and the time could not be spared to do it.

4.3. RESULTS AND FINDINGS

With the application of the proposed framework in the Dare to Build course, it was possible to draw some conclusions about the validity of this framework and the tools applied.

The results of the online surveys and workshops can be consulted in Appendices A to D.

To assess each one of the evaluation instances, two online forms were done (Appendix F), one meant for participants and the other one meant for the teachers and tutors of the course. The aim of these surveys was to collect the impressions and opinions of the implemented stages (and respective tools). The nonresponse ratio was high (13 out of 30 participants responded), with no responses from summer workers.

The analysis of these surveys, as well as the general findings, can be found in the two next sections.

4.2.2.1. Conceptual framework

There was a strong correlation between the defined phases of the co-creation process and the CDIO approach implemented in this project. Due to this fact, it was straightforward to identify which stage of the framework to apply and when.

The stages defined in the conceptual framework can vary in timing. For instance, some of the intended learning outcomes were evaluated continuously and the objectives were constantly tracked during this application, despite the stages being identified as standalone and episodic.

The stages addressing iterative, improvement, enabled more responsive solutions and critical and strategic thinking among the participants. But while some participants were using the tools presented for this stage with this purpose (while planning for the day, for instance), the ones that did not grasp it only saw this as one more task and consequently as a burden.

The evaluation parameters applied in this pilot study appeared to be representative of the general principles of a participatory process, although their relevance altered depending on the phase and stage of the project. This was observed while formulating questions for the different surveys and activities for the workshops delivered, where some parameters revealed to present more relevant results than others. For instance, the *Acceptability* and *Appropriateness* parameters were excluded from the Daily Evaluations, since they pertained to more to the co-initiation phase of the project, hence being used for the stage *Evaluate the main goal*.

Some problems in combining this research with the project have resulted in the ambiguity of certain stages of evaluation, which were not fully integrated and considered in the project management. In some cases, there were other evaluation activities being held in parallel (such another daily survey and wrap-up meeting), making participants feel overwhelmed over time.

It was concluded that the evaluation process is an intrinsic part of project management and should not be dissociated and implemented separately. Likewise, the role of an external evaluator presents certain risks to the evaluation process, since the distancing from the participants as well as the project can influence both the tools applied and the respective results in an adverse way.

Though as mentioned previously, the project had stakeholder representative coming from all different sectors (academia, civil society, public and private sectors), the evaluation process was not designed taking in mind the division of stakeholders among sectors, as the stakeholders that were more involved

were only from the academic sector (students and teachers). This could represent the next stage of development for this conceptual model.

4.2.2.2. Tools and activities

The results pertaining to the feedback survey can be found in Appendix F, and they are discussed in this section.

Daily Evaluations

The results obtained in the Daily Evaluations can be consulted in Appendix A. The non-response ratio was high (with a daily average of 8 responses, out of 30 participants), having decreased over time (from 39 answers in the first implementation week to 36 in the second). The summer workers did not participate in this survey at any moment.

Due to the amount of work that the participants had to perform in order to be able to finish the implementation of the project on time, the daily evaluations ceased to be filled in.

During the implementation/construction phase of the project, it was possible to facilitate iterative, improvement cycles with the daily logs, since this project consisted of a small urban intervention, with a relatively low number of people involved (30). It might not be the case for larger projects, with more entities involved, and it would be relevant to further investigate this matter.

The frequency of the daily evaluation was deemed excessive, with a majority of participants (53,8%) and the teaching team (80%), suggesting that this tool should be applied weekly, instead of daily. The majority found a continuous, frequent evaluation appropriate, with only 15,4% among the participants and 0% from the teaching team claiming that such a survey should only be done by the end of the project.

As for the daily evaluation format it was pointed out by participants that a live wrap-up meeting, with questions and flow based on the proposed parameters, would be more appropriate (76.9% opposed to 46,2% participants preferring an online survey, and 0% a written survey). The teaching team shared the same opinion, with 80% suggesting a meeting with this purpose. Although such a meeting was initially proposed as part of this research, due to time constraints, the time needed for this type of activity was not conceded.

One member of the teaching team suggesting designing a game with this purpose, while another suggested having these surveys constantly presented on a whiteboard. The latter was initially discarded for the sake of keeping the anonymity of the answers.

One student pointed out that the survey was repetitive and unchanged had a nullifying effect on the intended reflective thinking for this tool. The student suggested that the answers became, in some cases, systematised rather than reflective, while they also decreased in number over time. To tackle this, it was suggested that the questions should have been more integrated and precise, pertaining to certain happening in the project.

Face-to-face activities such as workshops might have higher added value than impersonal online surveys, especially when the number of people involved is relatively low. Though online surveys ensure anonymity in order to obtain more straightforward results, it might also result in too much detachment from the people and the project itself.

Regarding the stakeholders that were considered to participate in such a continuous evaluation, 100% of participants considered students to be required to participate, 84,6% considered the teaching team and

the summer workers and 46,2% considered that the other stakeholders should have been required to fill in such an evaluation. As for the answers of the teaching team, they deemed that students, the teaching team and summer workers should participate in these daily evaluations (100%), while other stakeholders only 40% deemed them required to do so.

Although the teaching team indicated that the parameters applied were relevant throughout the course, the majority rated their relevance a 3 (60%) opposed to 40% that rated it highly relevant (5). One member of the teaching team pointed out that though it could be of use to group them for better communication.

An important finding pertaining to the daily evaluations is related to the importance of explaining the purpose of the results while carrying out an evaluation workshop or survey, so all the parts can understand how they are benefitting from it.

Evaluating the main goal

The results obtained in the survey *Evaluating the main goal* can be consulted in Appendix B. As mentioned previously, the non-response ratio for this survey was low (12%).

The answers were made available to one of the course examiners and the project lead. Though it was initially intended to have some effect in the present project, it was suggested by the project lead that the collected responses should be taken into consideration in the next Dare to Build.

Most of the members of the teaching team considered a co-evaluation of the main goal of the project high relevant (60%). One member pointed out that students and teachers often have a different understanding of the goals and expectations in a course. This member claimed that this type of comparison helps primarily the teachers to change their stances for the purpose of facilitating the students' learning.

Defining project objectives

The results obtained in the workshop *Defining project objectives* can be consulted in Appendix C.

The majority of answering participants deemed this stage helpful, with 60% rating its utility a 4 and 40% a 5 (Appendix F), stating that it was relevant to formulate clear, common objectives while reminding them of certain design aspects of the project, instead of just focusing on their character teams work. Having formulated these common objectives, enabled the break down into smaller actions that would allow the fulfilment of these objectives.

The teaching team overall considered the workshop relevant (with 60% rating its relevance a 4 and 40% a 5), with members stating that it created a common ground and understanding between participants with different backgrounds, which sets the boundaries within which the team had to operate and communicate.

As to define these objectives with teachers and tutors as well as students from another field and summer workers, the majority of participants considered it helpful, with 46,2% rating its helpfulness a 4 and 30,8% rating it a 5. The respondents added that it was helpful to define objectives in a clear and ordered way so participants from other fields would be able to fully understand what they were meant to achieve. Moreover, it was stated that it was important that each person was on the same page and agreed to what was established, in order to keep morale and share the responsibility among everyone.

Concerning the involvement of other stakeholders, while 38,5% of the answering participants considered that they should have not been involved in this activity, 30,8% considered that they should have and 30,8% did not know. The opinions were torn between the participants considering the involvement of stakeholders a hindrance to the project, that would only overwhelm the project with more work, and the ones who thought that they should have been involved. As for the ones that did not know, one participant stated that it would highly depend on the stakeholder.

As to their opinion on whether other stakeholders should have been involved or not, all answered that they should. One member, though, stated that on one hand, their presence should be required, to have a clearer idea of what is possible and what is not within the project (legislation-wise, mainly) and so that the goals are in accordance with their overall expectations, but on the other hand it could compromise the groups' creativity if the stakeholders were to stick to and push for their own preconceptions on how the project should turn out.

Objective tracking

Most students (53,8%) rated the helpfulness of this tool neutrally as a 3. Some of the statements mention that not all participants paid attention to the objective tracking sheet and that the objectives that were not part of the project brief handed to the participants, ended up being neglected, possibly for the lack of time. On the other hand, some participants pointed out the usefulness of the tool since they were using it to check the objectives as they were formulated, in order to decide upon some tasks for the day.

While the teaching team considered the objective tracking to be relevant (60% rated it a 4 and 40% a 5), one member of the teaching team suggested that the approach might not be the most meaningful or visually appealing, suggesting that it could be of interest to design a more suitable tool for this purpose. Another member suggested it to be added to the daily wrap-up meetings suggested for the daily evaluations.

Daily logs

Participants opinions regarding the different daily logs were spread but they were mainly positive, with 23,1% rating the usefulness of the daily logs a 3 and a 4 *out of 5* and 38,5% rating it a 5 *out of 5*. Though some participants considered it largely relevant, as to record all important activities in order to aid in the planning for the day, a minority pointed out that they never filled them in nor looked at it, as they were too busy or overworked. It can be concluded that the purpose of the daily logs was required to be explained more than it was, as a few participants did not grasp their aim. Even so, the more cluttered with work the participants are, the less is their interest in logging their activities.

It was pointed out by one of the respondents that the information collected in these logs could be used for future projects, to analyse the process and workload the participants were subjected to, in order to make better decisions in these forthcoming interventions.

About the time spent in with these logs, the majority claimed that they did not spend too much time, with the majority rating it a 2 (53,8%), being 1 not much time and 5 too much time. The teaching team deemed it slightly more time-consuming, having 60% rated it a 3.

Though the daily logs were applied within the stage *Perform iterative improvement cycles*, as they provided aid to the daily planning, the great majority of respondents did not consider these to provide an opportunity to trace back to issues and gaps, as well as to make improvements in the project (76,9%).

Regarding their relevance, 4 out of 5 respondents deemed it very relevant (80%). One member of the teaching team pointed out that even though having the same detailed format for all of them highlights the equal importance of these roles, some of them were just unnecessarily elaborate, such as the Fika and Food Responsible and the Communications Officer daily logs, that consisted in more operational, repetitive tasks. This might have resulted in slightly increased paperwork.

Midterm evaluation

Concerning this workshop, though opinions were marginally scattered, 30,8% of participants rated its helpfulness a *4 out of 5* while 15,4% rated it *5*, having the slight majority rated it positively. Participants pointed out that it helped clarify and categorize tasks that were still left to do that pertained to the different objectives, as well as identifying priorities (the whole signage of the learning environment was given priority at this point). One member stated that it was helpful to make sure how the fulfilment of objectives was truly going.

On the other hand, a few participants stated that it was not so useful, as their own construction team was already aware of what they had to do. This displays that a number of participants did not grasp the aim of this activity, which was to gather participants, teachers and tutors together, as a whole group, to get updated on the overall status of the project and decide upon a course of action for each objective. These actions could pertain to the work of a single team or the group as a whole.

Participants opinions are tied when it came to using this workshop to enable iterativity (41,7% answered that it provided the opportunity to trace back some issues and/or gaps, while 33,3% stated the opposite and 25% did not know).

As for the teaching team, it rated the workshop's relevance primarily positive (with 40% rating it a *4* and another 40% as a *5*). It was pointed out that, on one hand, it was a good way to reflect upon the project as a whole group, while it served to fortify the relationship among the participants and having them contributing directly to the decision-making process. However, on the other hand, participants were tired of cumulated work from the previous days, and they might have not been in the mood for such an activity.

4.4. SUMMARY

For partially assessing the validity of the CO-VALUE framework, a pilot study was performed in a *design and build course* carried out by the Department of Architecture and Civil Engineering of the Chalmers University of Technology. Due to time and collaboration constraints, it was only possible to assess a set of the framework's evaluation steps.

The course was chosen for this pilot since it is a follow-up of the autumn course Design and Planning for Social Inclusion (DPSI), where students are challenged to put participatory and co-creation processes in practice. One of the projects carried out in DPSI is chosen to be carried out in the Dare to Build (D2B) summer course, this time by students of both engineering and architecture backgrounds. Due to its collaborative and co-creative this course proved to be an adequate environment to perform a preliminary test of this conceptual framework.

With the application of six stages of the proposed framework in the Dare to Build course, it was possible to draw some conclusions about the validity of this framework and the tools applied.

The stages defined in the conceptual framework can vary in timing. Moreover, the stages addressing iterative, improvement, enabled more responsive solutions and critical and strategic thinking among the participants, though a few participants did not grasp their purpose.

There were some issues in combining this research with the project, which have resulted in the ambiguity of certain stages of evaluation. It was concluded that the evaluation process is an intrinsic part of project management. Moreover, the role of an external evaluator presents certain risks to the evaluation process, since the distancing from the participants and the project can influence both the tools applied and the respective results in an adverse way.

The evaluation parameters applied in this pilot study appeared to be representative of the general principles of a participatory process, although their relevance altered depending on the phase and stage of the project.

This application process was not designed taking in mind the division of stakeholders among sectors, as the stakeholders that were more involved were only from the academic sector (students and teachers). This could represent the next stage of development for this conceptual model.

As for the tools applied, they were generally well-received and used. It was possible to conclude that it is important to stress the purpose of each activity and survey to the participants, to motivate them to participate in them. The continuous aspect of this framework might be in question, as the daily evaluations tool was perceived as too tiresome and repetitive. Further analysis would be needed to understand if this aspect is indeed beneficial for co-evaluation or if it is the tools to apply it that need to be improved.

5

CONCLUSIONS AND RECOMMENDATIONS

Although participation in urban planning and design flourished to give voice to those who have been historically deprived of one, in today's society, participation should not be understood as a uniformised concept, where the receiver is seen as the standard user.

Co-creative urban planning and urban design projects are innovative initiatives, capable to engage stakeholders for more effective and socially responsible results, as well as a heightened sense of ownership felt by all actors. To understand their needs and contexts different forms of participation are necessary (Blundell Jones *et al.*, 2005).

Despite the abovementioned, participation might harness particular uncertainties and issues, such as inadequate representation, complacency, associated costs, time consumption and persistent selfishness shown by stakeholders (Renee and Stansbury, 2004). In addition, Miessen (2010) mentions that there is an increasingly overuse of the term *participation*, and urges for models beyond consensus that see past the dubious innocence of participation, which often hides ulterior motives from different entities. Thus, involving different stakeholders must be carefully analysed and considered before implemented. Participation is not infallible and does not always bring results that are just and representative of the current realities.

According to Jenkins and Forsyth (2009), it is relevant to understand how participation is practised during a project. Evaluation is a relevant phase for any urban initiative and turning it into a collaborative process is worth addressing and studying in different domains and contexts.

Much like participation, evaluation is far from being an exact science, with certain methods and accurate, systematic approaches. It is rather subjective and qualitative, open to suppositions, but also open to new methods and tools. "*The art of evaluation involves creating a design that is appropriate for a specific situation and particular action or policy-making context*" (Patton, 2002, p. 249). For that manner, evaluators should be creative, using their abilities and technical expertise to design new approaches and methods for evaluation that prove to be fitting for each policy, socio-political context and needs of the stakeholders.

Co-evaluation is the embodiment of collaborative participation and evaluation. Individuals and communities feel increasingly entitled to see results flourish from their own opinion and voice. Thus, it is necessary to further study how to employ co-evaluation when it comes to design urban spaces, although not only within academia but also in a setting involving civil society, the public sector and the

private sector. Different geographical contexts might be able to benefit from such a framework, depending on their policies, needs and challenges.

5.1. MAIN CONCLUSIONS

This research aimed to formulate a literature-based conceptual co-evaluation framework and understand how it could influence an academic co-creation project, what kind of parameters would be most adequate and finally reflect on the possibility of consigning such a framework in other domains/sectors and contexts, namely Porto, Portugal. It was aimed to fill in the gap in the literature concerning co-evaluation processes in urban planning and urban projects.

Based on a pilot test, through qualitative methods, it can be concluded that an explicit, continuous co-evaluation framework can improve a co-creation process if the methods and tools used to put it in practice are adequate and opportune.

Due to the fact that the pilot study was carried out in a small urban intervention, and due to the absence of involvement of different stakeholders in this project other than the participants and teachers (though intended for this design and build project) leaves some open questions regarding how this framework would adapt in a different type of intervention, with different entities involved.

The results show that, for small interventions, a project can benefit from a framework that facilitates continuous and iterative improvement cycles, to adapt to all conditions and to better answer to the stakeholder needs, assuming that the latter were involved.

The evaluation parameters set in this research appeared to be representative of the general principles of a participatory process, although their relevance alters depending on the phase and stage of the project or initiative. This was observed while applying them in evaluation tools such as surveys or workshops.

Due to time constraints, not all the stages from the proposed framework were applied and tested, such as the evaluation of the project handover to the relevant entities and the community. Furthermore, one of the planned workshops did not take place because of delays in the implementation of the project.

It was possible to observe with this research that it is important to make clear the reason why either a method or tool is being applied and how the results will be used to the individuals involved in the co-evaluation process. Not doing so, might result in uninterest and consequent lack of participation in the evaluation activities or surveys.

To entirely understand the potential of this framework and amply comprehend its influence on a participatory or co-creation project, future studies could address each phase and stage in more detail, with the conception of adequate, sensitive co-evaluation guidelines along with a toolset, with methods such as workshops, games and surveys suitable for different contexts and sectors, adjustable to the type of project.

Additionally, the possibility of evaluating participatory and co-creative projects that happened in the past using this conceptual model could be considered, with another set of more objective, parametrical questions and activities, even though that in this proposed case, co-evaluation would be harder to apply.

5.2. FURTHER APPLICATIONS OF A CO-EVALUATION FRAMEWORK

The practical approach adopted in this research focused mainly on applying a suggested conceptual framework in an academic context (see section 1.3.), focusing to the collaboration between students of different fields (engineering and architecture) and their teachers.

In order to present such methodology, the work of authors from other domains (other than urban planning and urban design), such as IT (Bossen *et al.*, 2016) and health (von Thiele Schwarz, 2016) was invoked as guiding material — respectively a literature survey on evaluation in participatory design and a functional participatory evaluation framework. Thus, the methodology presented in this research could be potentially conveyed to other domains or sectors, given the existence of similar methods in these areas, such as the ones referenced in this research. In order to confirm this possibility, further research is required.

Furthermore, additional research is needed to understand how a co-evaluation framework could bring different entities from different domains (such as architecture, engineering, IT, health, etc) and sectors (civil society, academia and the public and private sectors) together in order to collaborate and to achieve common goals.

More than ever, transcending one's disciplines and fields of expertise is crucial to understand the current needs and issues of society, as well as our environment, when it comes to urban initiatives and projects. To break these expertise and sector silos, it might be worth studying further how to accurately understand our surroundings and the entities that populate them by bringing them together through co-reflection and co-evaluation so better solutions are formulated.

It could also be of relevance to study further how could such a framework be used as a mechanism used to fight social injustice and disparities, while using this collaboration and transcendence among sectors and domains as the focal tool, as well as gathering entities that do not collude so often, in a balanced and just manner.

As to understand the relevance of further studies of the application of co-evaluation other contexts, for instance, in Portugal, it is pertinent to look at the country's historical context, and how it contributed to the rise of participatory processes in urban planning and urban design.

After the revolution of April 25 1974, a new political context emerged in Portugal, one that would catalyse social transformation and urban social movement, citizen power and the right to the city with it (Pereira, 2014).

While urban social policies had been neglected in the past and the strategies for social housing would follow the modernist concept of peripheral social neighbourhoods, the SAAL program (Serviço Ambulatório de Apoio Local) would come as a completely different response in 1974 (Silva Soares, 2017). It stemmed from everyone's desire to the right of a decent home since almost a quarter of the country's population lived in precarious conditions.

The SAAL program was intended to deliver the initiative to a poorly housed population in Portugal (namely in Porto, in the so-called urban *ilhas*), in order to collaborate and contribute to the change of their own neighbourhoods, with their own resources (from their own labour to their own finances). It implied giving voice to the residents and understand their needs, democratising the technical work associated with it and ensuring a continuous flow of information and knowledge with both the population and the municipalities. It is considered the symbol of participation in Portugal (Silva Soares, 2017).

Due to the urgency of the situation, SAAL was intended to adopt a pragmatic approach to enable an effective and efficient response in the short term. A factor that was crucial for the implementation of this program by the government, which sought to tackle the hardships felt in kickstarting conventional building programs on a short time span. Time was key, but the development of the revolutionary process and the articulation with the residents' movement was not as linear as expected. The program would see its end due to the non-regulation of the relationship between SAAL and the municipalities, which caused diverse problems. A lot of tension rose from this lack of explicit definition, and the project saw its end in 1976 with many interventions not being fully completed (Pereira, 2014).

It would be relevant to understand how a co-evaluation framework such as the one presented in this research would have changed this program, especially when it comes to defining an explicit collaboration with the relevant stakeholders. For this case in specific, it is worthwhile asking how, if conveniently formulated and regulated, a co-evaluation framework involving the residents, the municipalities and the technical agents would have influenced the program.

Overregulating, though, can constitute a hazard when it comes to establishing iterative, responsive processes. Regulations often rely on very traditional and linear project flows, which are easier to define and formulate large national programs such as the SAAL projects.

Focusing on up-to-date Porto, a prevailing issue that menaces the city from an urbanistic and social point of view is gentrification. Gentrification is “*broadly defined as a process of urban change through the influx of more affluent residents and/or users*” (Carvalho *et al.*, 2019). Though largely denied by the public sector, it is altering the shape and the identity of the city, leading residents to peripheral areas and leaving the city centre to temporary city users.

More and more, the private and public sector collaborate to answer the market forces that invite an increasing number of temporary “consumers” of the city, inviting out the people that actually participate and belong to the city.

A contemporary case of participation in Porto stems from an incomplete SAAL project, in the *Ilha da Boa Vista* neighbourhood. The intervention, led by the municipality of Porto, was an experimental project of urban rehabilitation and it sought to have a participatory and cooperative approach between the residents, the municipality, architects and planners and also students of architecture, thus joining all domains. It fostered the right to the city, that was quickly being forsaken due to the gentrification forces felt in the city, mainly due to other past processes of urban rehabilitation that moved a lot of local residents to peripheral areas of the city (Matos Rodrigues and Silva, 2015). Would more projects such as this, allied with a collaborative (instead of cooperative), continuous evaluation of their creation process be able to fight the dominating forces of gentrification and bring balance to the city?

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APPENDICES

APPENDIX A – DAILY EVALUATIONS

Daily Evaluation

This form will take around 10 minutes to fill in.
The answers of this form will be kept anonymous.

Thank you for your collaboration!

Parameters Evaluation

1. Capacity Building

Were you given the knowledge and skills you need to perform the tasks you were assigned today?

Mark only one oval.

	1	2	3	4	5	
Not at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Definitely

2. Direction

Was it clear to you what tasks you had to perform today? Did you always know what to do?

Mark only one oval.

	1	2	3	4	5	
Not at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Definitely

3. Inclusion

Was there any involvement from the community and other actors in the work performed today?

Mark only one oval per row.

	Yes	No	I don't know	Not relevant
COWI	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Park och Natur	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Familjebostäder	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gårdsåsmosseskolan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Community members/children	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. Knowledge

Was the knowledge from the various stakeholders taken into consideration for the tasks you performed today?

Mark only one oval per row.

	Yes	No	I don't know	Not relevant
COWI	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Park och Natur	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Familjebostäder	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gårdsåsmosseskolan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chalmers teaching team	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Students from another field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Summer volunteers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Community members/children	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. Iterativity

Have you had the opportunity to trace back to some mistakes done and make an improvement today?

Mark only one oval.

	1	2	3	4	5	
Not at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	In every occasion

6. Ownership

Do you feel any ownership for the work you have performed today?

Mark only one oval.

	1	2	3	4	5	
None at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	A lot

7. Support

How much support were you given to perform the tasks you were assigned today?

Mark only one oval.

	1	2	3	4	5	
None at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	A lot

8. Communication

Did you communicate with any of the listed stakeholders today?

Mark only one oval per row.

	Yes	No	I don't know	Not relevant
COWI	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Park och Natur	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Familjebostäder	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gärdsåsmosseskolan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chalmers teaching team	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Summer volunteers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Community members/children	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. Alterations and Deviations

Were there any changes to plans today?

Mark only one oval.

Yes

No

I don't know

Not relevant

10. Contribution

How did you participate? How much did you make yourself contribute?

Mark only one oval.

	1	2	3	4	5	
Not at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	A lot

Learning Log

Only for Chalmers students!

11. Who are you?

Mark only one oval.

- Chalmers architecture student *Skip to question 13.*
- Chalmers engineering student *Skip to question 12.*
- None of the above *Stop filling out this form.*

Engineering Learning Log

12. How much did you develop each of these learning outcomes (abilities and skills) today?

1 - Not at all 5 - A lot

Mark only one oval per row.

	1	2	3	4	5
Use co-creation methodology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Develop a conceptual design	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Implement technical solutions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Communicate different proposals to stakeholders	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Apply engineering tools and methods	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Work in multidisciplinary project teams	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Architecture Learning Log

1 - Not at all 5 - A lot

13. How much did you develop each of these learning outcomes (abilities and skills) today?

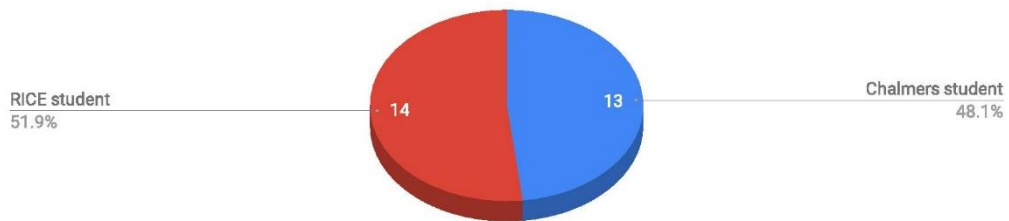
Mark only one oval per row.

	1	2	3	4	5
Use co-creation methodology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Conduct an explorative project to design	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Design and assess concrete architectural proposals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Communicate different proposals to stakeholders	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Apply architectural tools and methods	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Work in multidisciplinary project teams	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Powered by

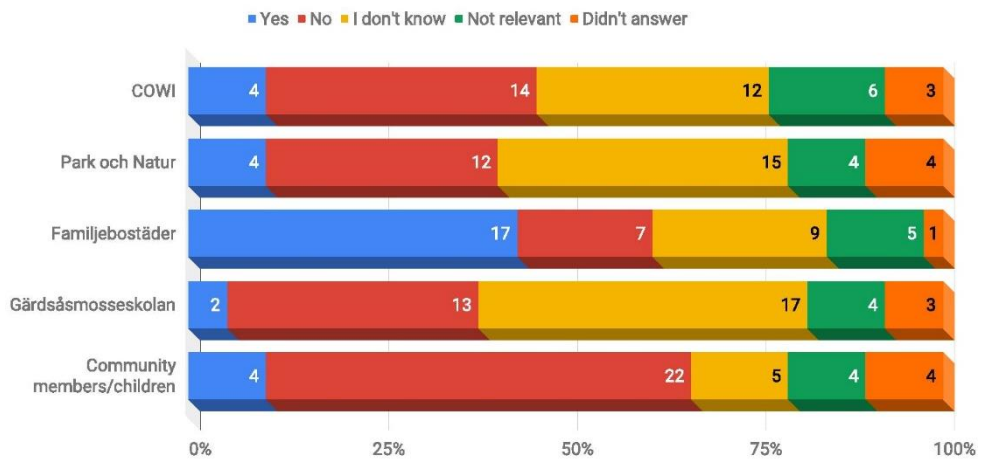


You are a...



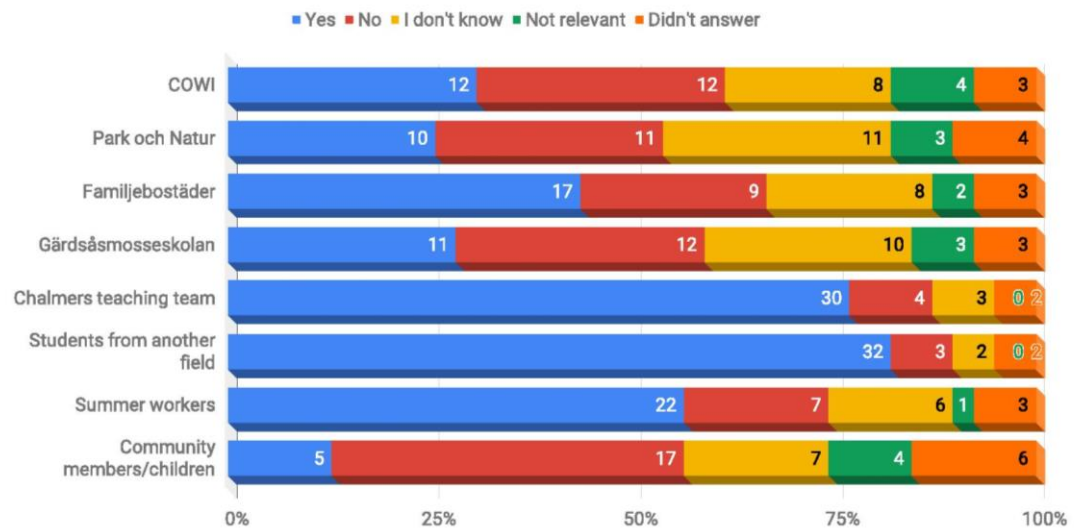
Inclusion

Was there any involvement from the community and other actors in the work performed today?



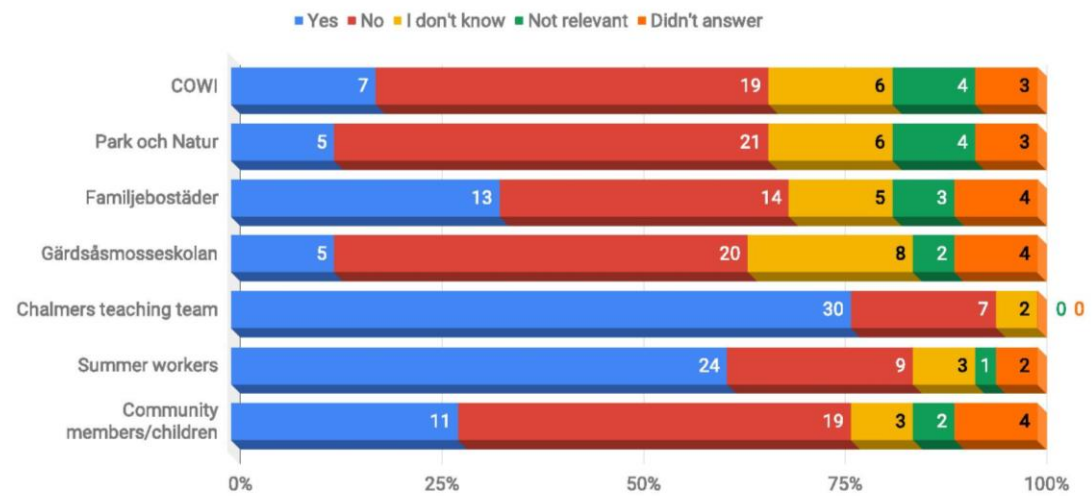
Knowledge

Was the knowledge from the various stakeholders taken into consideration for the tasks you performed today?



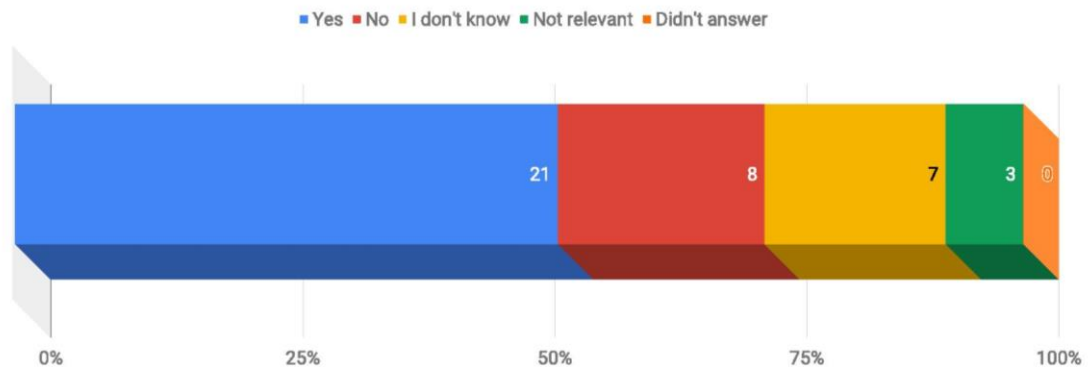
Communication

Did you communicate with any of the listed stakeholders today?



Alterations and Deviations

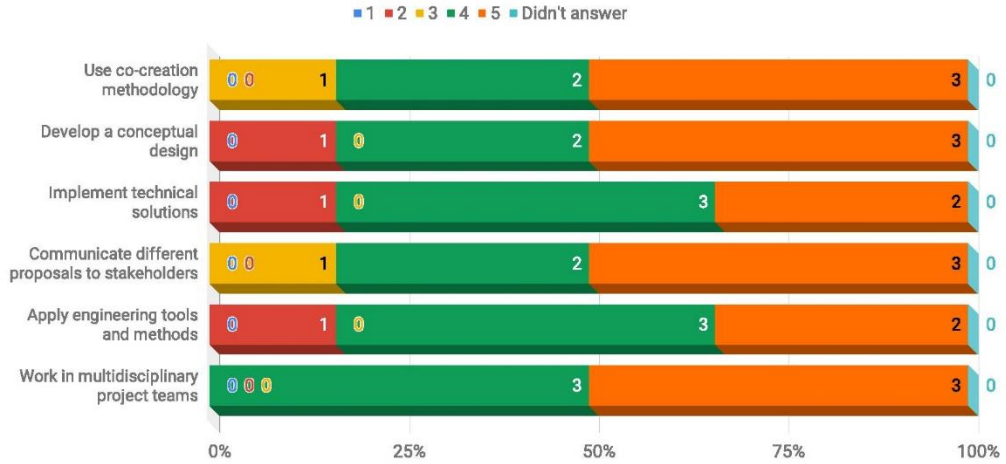
Were there any changes to plans today?



Learning Logs ARCHITECTURE 9
ENGINEERING 6

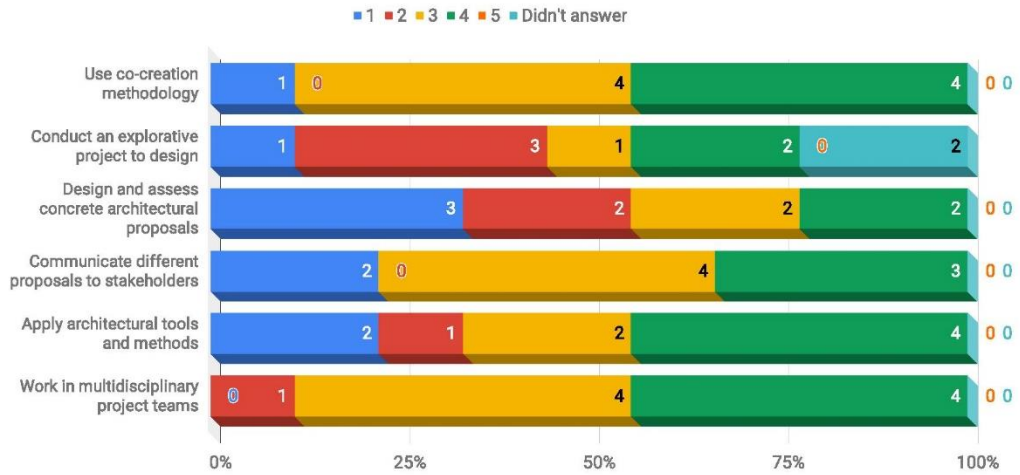
Engineering Learning Log

How much did you develop each of these learning outcomes (abilities and skills) today? (1 - Not at all, 5 - A lot)



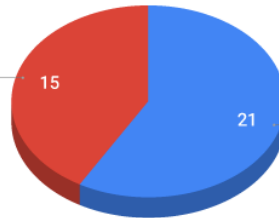
Architecture Learning Log

How much did you develop each of these learning outcomes (abilities and skills) today? (1 - Not at all, 5 - A lot)

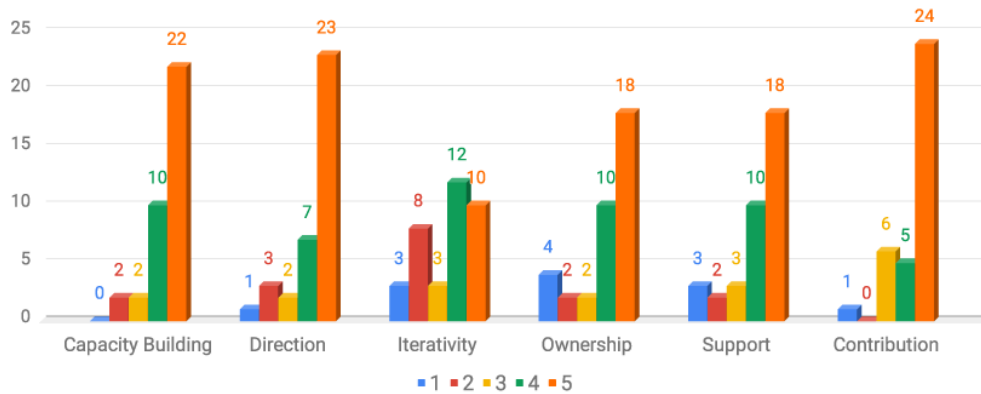


You are a...

RICE student
41.7%

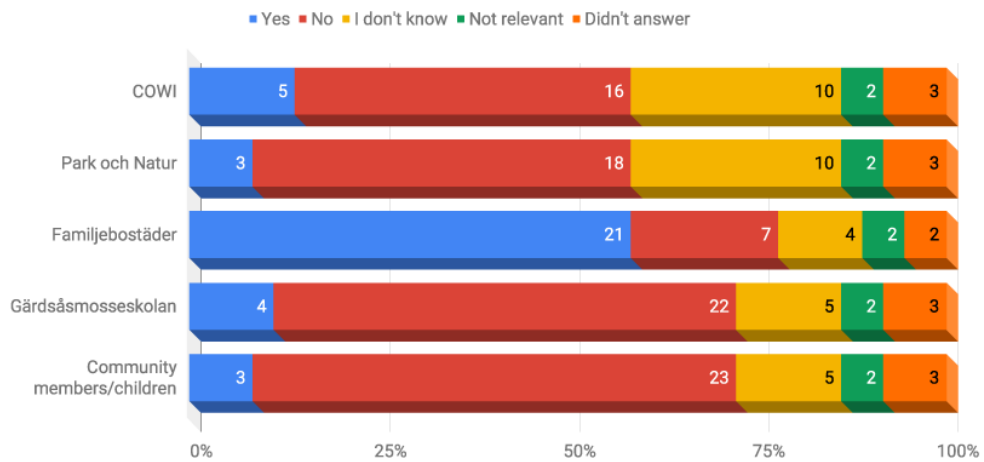


Chalmers student
58.3%



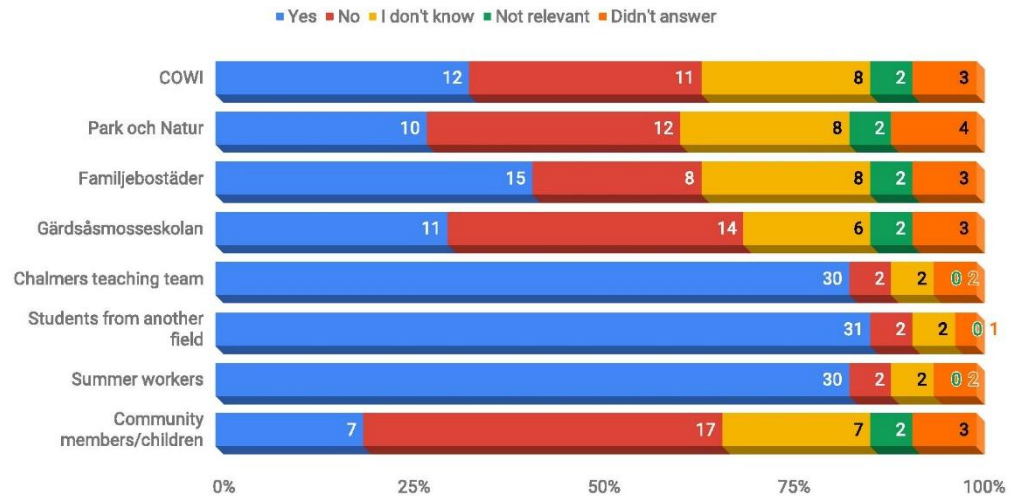
Inclusion

Was there any involvement from the community and other actors in the work performed today?



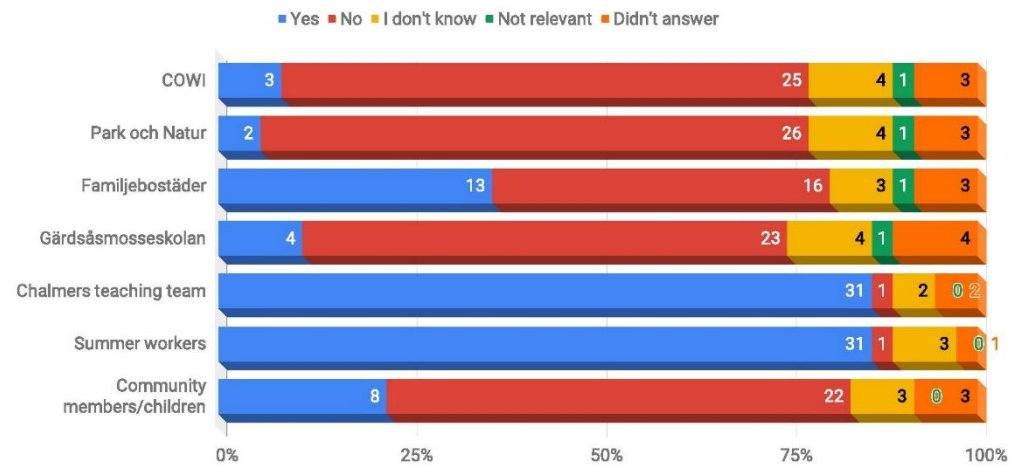
Knowledge

Was the knowledge from the various stakeholders taken into consideration for the tasks you performed today?



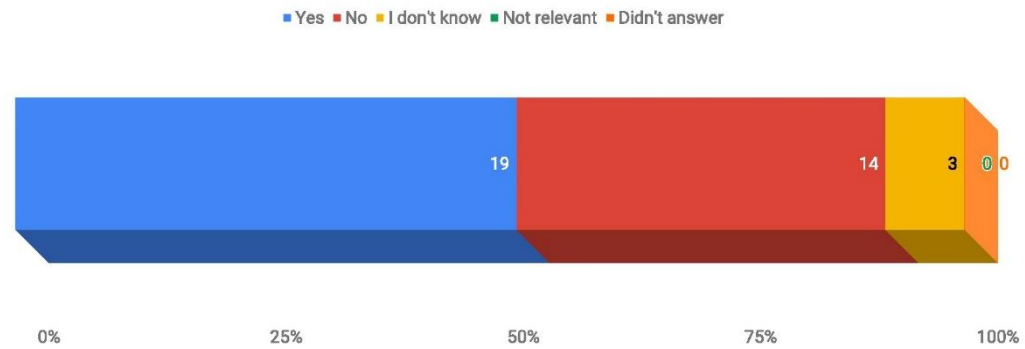
Communication

Did you communicate with any of the listed stakeholders today?



Alterations and Deviations

Were there any changes to plans today?

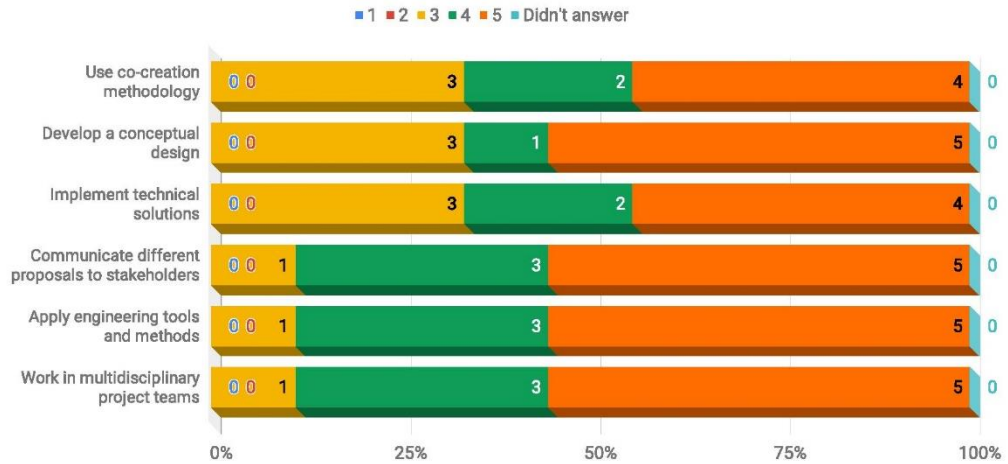


Learning Logs

ARCHITECTURE 13
ENGINEERING 9

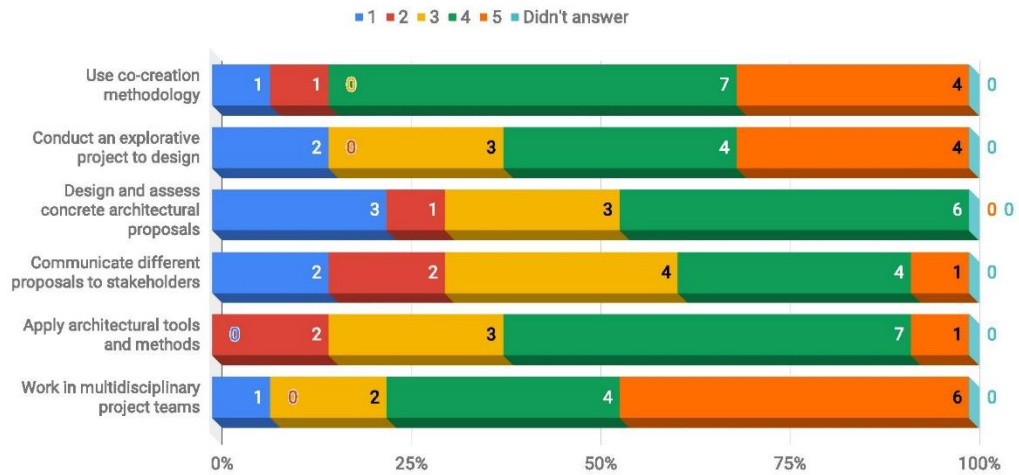
Engineering Learning Log

How much did you develop each of these learning outcomes (abilities and skills) today? (1 - Not at all, 5 - A lot)



Architecture Learning Log

How much did you develop each of these learning outcomes (abilities and skills) today? (1 - Not at all, 5 - A lot)



APPENDIX B – EVALUATING THE MAIN GOAL

Evaluating the main goal

Hello there!

In this form, there are around 10 open questions for you, and it will take around 15 minutes to answer them. Please, elaborate your answers, but try to be concise.

Note that none of these questions is mandatory, so, answer as many (and as much) as you are able to.

All answers will be used later on. Your answers will remain anonymous.

Thank you a lot for your time!

* Required

1. Do you agree with the usage of your answers? *

Mark only one oval.

- Yes
- No Stop filling out this form.

2. You are a...

Mark only one oval.

- Chalmers student
- Guest (EEG Rice)
- Company representative (Park- och Naturförvaltningen, COWI)
- Institutional representative (Chalmers course leaders)
- Community member

3. How clear to you is the main goal of this project?

Mark only one oval.

	1	2	3	4	5	
Not clear at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very clear

4. How clear to you is the connection between the main goal and the project itself?

Mark only one oval.

	1	2	3	4	5	
Not clear at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very clear

5. What do you think could be improved?

Or leave any comment on the previous questions.

6. How relevant do you think this project is for this context?

Mark only one oval.

1 2 3 4 5

Not relevant at all Very relevant

7. Please elaborate on your answer.

8. How much do you look forward to the changes that this project will lead to?

Mark only one oval.

1 2 3 4 5

Not eager at all Very eager

9. Please elaborate on your answer.

10. In your opinion, what knowledge and skills do you need to put this project into place?

11. Pick one skill or knowledge that you would like to improve during this project.

12. How much information have you been given about what is expected of you?

Mark only one oval.

1 2 3 4 5

None More than enough

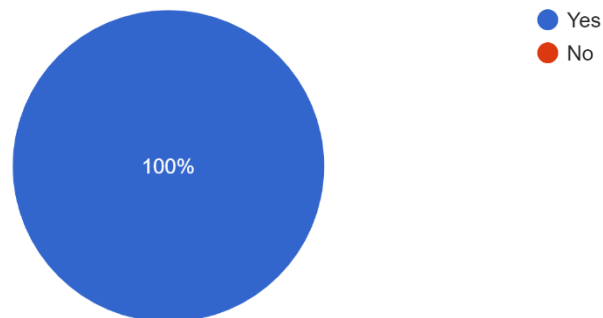
13. Please elaborate on your previous answer.

Powered by
 Google Forms

SURVEY ANSWERS

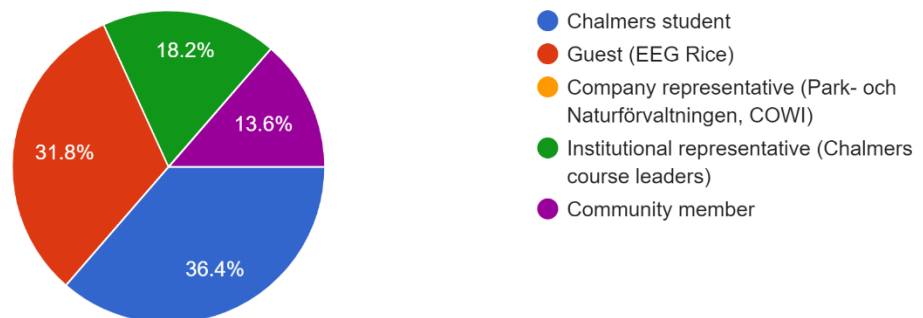
Do you agree with the usage of your answers?

23 responses



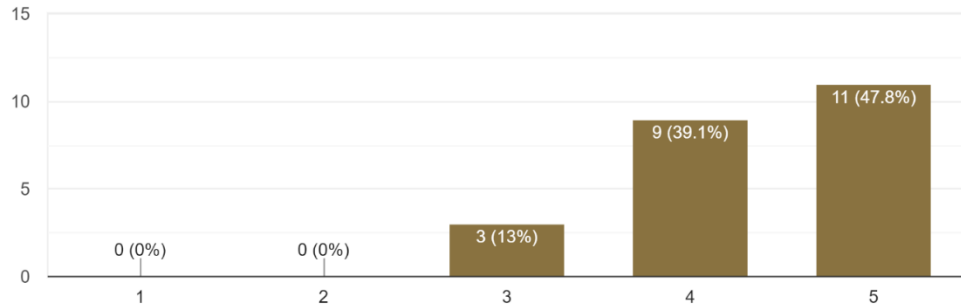
You are a...

22 responses



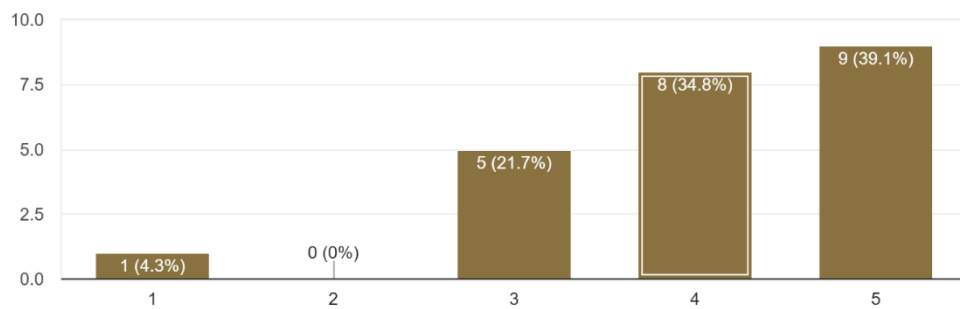
How clear to you is the main goal of this project?

23 responses



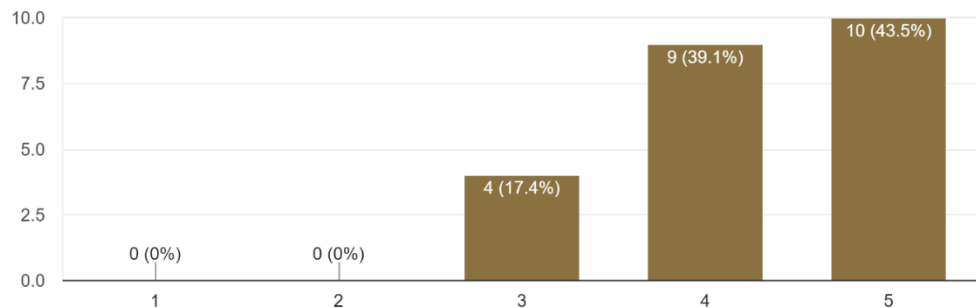
How clear to you is the connection between the main goal and the project itself?

23 responses



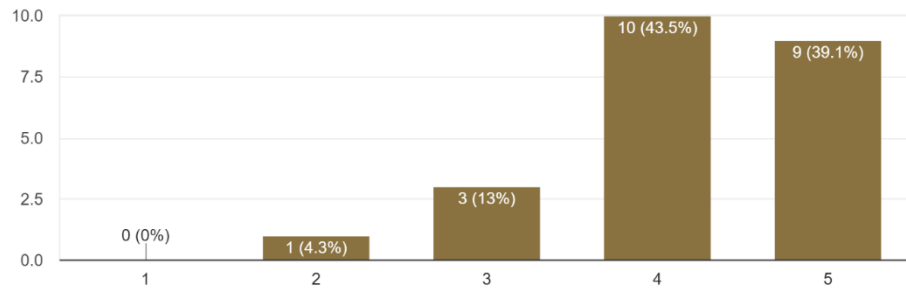
How relevant do you think this project is for this context?

23 responses



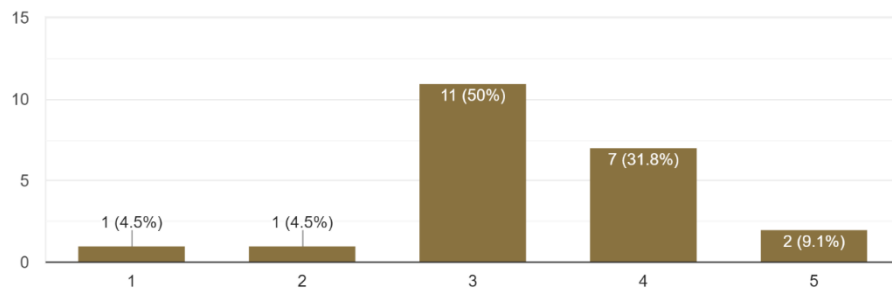
How much do you look forward to the changes that this project will lead to?

23 responses













How much information have you been given about what is expected of you?

22 responses



APPENDIX C – DEFINING PROJECT OBJECTIVES

 <p>SPECIFIC Clearly define the expected result.</p>	 <p>MEASURABLE Quantify your objective, to know when you have achieved it.</p>	 <p>ACHIEVABLE Take the different constraints (environment, resources, etc.) into account.</p>	 <p>RELEVANT Specify why it is relevant for the different stakeholders or for the project itself.</p>	 <p>TIME-BOUND Specify the deadline or target date for achieving your objective.</p>
ASSESS USER APPRECIATION	Creation of a user appreciation ratio <small>(success mark = 4,5)</small> <small>1 - Would never come back</small> <small>5 - Liked and would tell others to come</small>	Used previous input from children	Made for children	10 years
ENSURE SAFETY FOR CHILDREN	Conforms to all safety regulations No sharp items All structures stable Safe fall provided	Terrain might be hard to control	Prevents accidents Children-friendly	July 5rd
MAXIMIZE USAGE OF NATURAL AND REUSABLE MATERIALS	Majority of the materials used is natural and reusable	Materials are already available in the area Materials are inexpensive [C] Problems with durability	Ecofriendly Good for the community for educational purposes	July 5rd
BUILD A BOND BETWEEN THE GROUP	Everyone knows everyone's name	Rotation of smaller groups Lunch and fika breaks activities [C] People coming in and out	Expand social artwork Everyone knows all their available resources Breaks down boundaries for critical conversations	June 21st
APPLY BIOMIMICRY	4 out of the 5 character interactions have a biomimicry component	Researched animal processes Use surrounding materials Lecture received	Ecofriendly Good for the community for educational purposes	July 5rd
ENSURE WHEELCHAIR ACCESSIBILITY <small>(from mushroom path)</small>	No gradients over 15% No bumps > 5 cm Wheelchair maneuvering space dimensions	Necessary materials available Fully connected designed path	Allows the space to be visited by wheelchair users	July 5rd

<p>OBJECTIVE SETTING</p> <p>PATRICIA PIRES 02823001763666623 +351 934 702213</p>		<p>T</p>  <p>TIME-BOUND Specify the deadline or target date for achieving your objective.</p>	<p>R</p>  <p>RELEVANT Specify why is it relevant for the different stakeholders or for the project itself.</p>	<p>A</p>  <p>ACHIEVABLE Take the different constraints (environment, resources, etc.) into account.</p>	<p>M</p>  <p>MEASURABLE Quantify your objective, to know when you have achieved it.</p>	<p>S</p>  <p>SPECIFIC Clearly define the expected result.</p>

APPENDIX D – DAILY LOGS

TEAM RESPONSIBLE
CO

ENTRY DATE

DAILY TEAM LOG

COMMUNICATIONS OFFICER





✓ PLANNING

PATRICIA PIRES
up200901789@fe.up.pt
+351 934 702 213

LEGEND

PM PROJECT MANAGER
SS SITE SUPERVISOR
SEO SAFETY & EFFICIENCY
CO COMMUNICATIONS
FFG FOOD & FIKA

STATUS CODE

Not Started 
Ongoing 
Done 
Cancelled 

ACTIVITY LOG

08:30	
09:00	
09:30	
10:00	
10:30	
11:00	
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12:00	
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13:30	
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14:30	
15:00	
15:30	
16:00	
16:30	
17:00	
17:30	

COMMENTS

TEAM RESPONSIBLES

FFG

FFG

ENTRY DATE

DAILY TEAM LOG

FOOD & FIKA GURUS

✓ PLANNING

PATRICIA PIRES
up200901789@fe.up.pt
+351 934 702 213

LEGEND

- PM PROJECT MANAGER
- SS SITE SUPERVISOR
- SEO SAFETY & EFFICIENCY
- CO COMMUNICATIONS
- FFG FOOD & FIKA

STATUS CODE

- Not Started ⊙
- Ongoing →
- Done ✓
- Cancelled ✗

ACTIVITY LOG

08:30	
09:00	
09:30	
10:00	
10:30	
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15:30	
16:00	
16:30	
17:00	
17:30	

COMMENTS

DAILY COORDINATION TEAM

PM	<input type="text"/>	CO	<input type="text"/>
SS	<input type="text"/>	FFG	<input type="text"/>
SEO	<input type="text"/>	FFG	<input type="text"/>

ENTRY DATE

DAILY TEAM LOG

DAILY COORDINATION TEAM






✓ TASK LOG

PM





WHAT	WHEN	WHO	STATUS

PATRICIA PIRES
up200901789@fe.up.pt
+351 934 702 213

LEGEND

- | | |
|---|--|
|  PROJECT MANAGER |  COMMUNICATIONS |
|  SITE SUPERVISOR |  FOOD & FIKA |
|  SAFETY & EFFICIENCY | |

STATUS CODE

- | | |
|-------------|---|
| Not Started |  |
| Ongoing |  |
| Done |  |
| Cancelled |  |

ACTIVITY LOG

SS

08:30	
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16:30	
17:00	
17:30	

COMMENTS

ACHIEVEMENTS & CHALLENGES

LESSONS LEARNED

SAFETY LOG

SAFETY & EFFICIENCY

SEO	<input type="text"/>	ENTRY DATE	<input type="text"/>
UNSAFE ACTIVITIES / SITUATIONS		INJURIES	
HOW TO MITIGATE			

SEO	<input type="text"/>	ENTRY DATE	<input type="text"/>
UNSAFE ACTIVITIES / SITUATIONS		INJURIES	
HOW TO MITIGATE			

APPENDIX E – EVALUATING PROJECT OUTCOMES

02 ENSURE SAFETY FOR CHILDREN

MEASURABLE CRITERIA

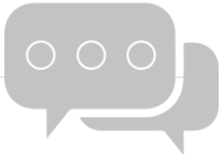


ALL STRUCTURES ARE STABLE

NO SHARP ITEMS

SAFE FALL PROVIDED

<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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FINAL TAKE-AWAYS

		
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APPENDIX F – FEEDBACK SURVEY

Framework Application ~ Feedback Survey

This form will take around 10-15 minutes to fill in. Its purpose is to gather your feedback regarding the tools I have implemented to test the co-evaluation framework I am working on for my thesis. Without your feedback, I cannot draw the right conclusions about whether these tools have worked or not, so I really need your help.

Thank you for your collaboration!

* Required

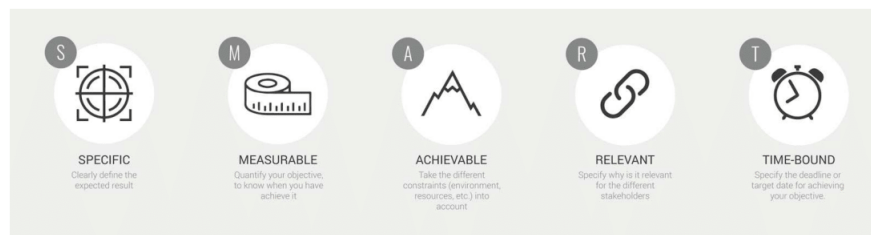
1. You are a... *

Mark only one oval.

- Student (Chalmers, Rice)
- Summer worker

Defining project objectives

In this workshop, participants and teachers were asked to define together the project objectives. The S.M.A.R.T. criteria (as shown below) were used to defined them. You can check the session outcomes here: <http://bit.ly/2ROHdbI>



2. How helpful do you think it was to define project objectives (common to everyone, despite being part of different teams)?

Mark only one oval.

1 2 3 4 5

Not helpful at all Very helpful

3. Elaborate on your previous answer.

4. How helpful do you think it was to define project objectives alongside teachers and other participants (students from another field and/or summer workers)?

Mark only one oval.

1 2 3 4 5

Not helpful at all Very helpful

5. Elaborate on your previous answer.

6. Do you think other stakeholders should have been involved?

Mark only one oval.

- Yes
 No
 I don't know

7. Elaborate on your previous answer.

Daily Evaluations

The Daily Evaluations consisted of a survey that students had to fill in daily. The questions were based in ten out of twelve evaluation parameters (described below). You can check the overall results in this link: <http://bit.ly/306O6aW>



8. How frequently do you think it would be the most appropriate to do such an evaluation?

Mark only one oval.

- Every day
 Every week
 Once at the end of the project
 Never

9. What format(s) would you deem useful to continuously evaluate the parameters above during the project?

Check all that apply.

- Wrap-up meeting
- Online survey
- Written survey
- Other: _____

10. Who do you think should participate in such an evaluation?

Check all that apply.

- Students
- Teaching team
- Summer workers
- Other stakeholders (COWI, Park och Natur, community members, etc)

11. Any comments?

Objective Tracking

The Objective Tracking sheet was displayed under the site's whiteboard. The coordination team checked the days for each they had contributed for a certain objective, in order to track what objectives were being neglected, were being worked upon, etc. Identifying the objectives that were being neglected could alert the daily coordination team to either start acting or cancelling the objective.



12. How helpful do you think it was to fill in the objective tracking sheet?

Mark only one oval.

1 2 3 4 5

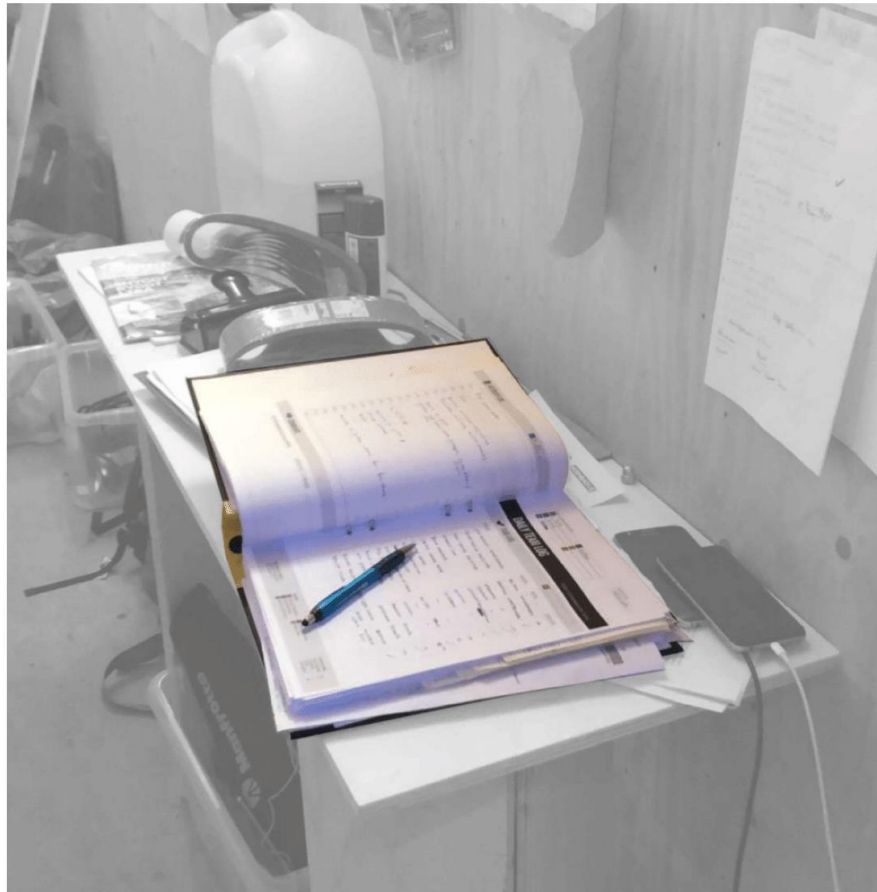
Not helpful at all Very helpful

13. Elaborate on your previous answer.

14. How would you have done it differently?

Daily Logs

The following questions pertain to the four different types of daily logs used: a general daily log for the project planning, a daily log for the Communications Officer and the Food and Fika Responsibles respectively, and a safety log where the Safety and Efficiency Officer recorded any dangerous behaviour and practices as well as injuries.



15. How helpful do you think it was to use daily logs?

Mark only one oval.

1 2 3 4 5

Not helpful at all Very helpful

16. Elaborate on your previous answer.

17. How much time did you spend filling them in?

Mark only one oval.

1 2 3 4 5

Almost no time at all Way too much time

18. Have you had the opportunity to trace back to some issues/gaps and make an improvement in the project with the daily logs?

Mark only one oval.

Yes
 No
 I don't know

19. What would you improve about them?

Midterm Evaluation

A workshop that took place on June 27th 2019 served as a midway check for the state of the project. On a first stage, participants and teachers were asked to write down individually for each objective the tasks that were done, ongoing and the ones that were yet to be done by the time of the workshop. After this, students and teachers were divided into groups and they were assigned an objective. The groups were asked to write a course of action for each objective, based on what was listed.





20. How helpful do you think it was to do this activity?

Mark only one oval.

1 2 3 4 5

Not helpful at all Very helpful

21. Elaborate on your previous answer.

22. Have you had the opportunity to trace back to some issues/gaps and make an improvement in the project with this workshop?

Mark only one oval.

- Yes
- No
- I don't know

Evaluate learning outcomes

23. Who are you? *

Mark only one oval.

- Chalmers architecture student Skip to question 24.
- Chalmers engineering student Skip to question 25.
- None of the above Skip to question 26.

Architecture Learning Outcomes

24. Which learning outcomes you believe you have fulfilled?

Check all that apply.

- Describe and refer to different methods and approaches to integrated sustainable architectural design solutions
- Identify and explain the different practical implications of applied architectural design for a sustainable built environment
- Identify and explain the structure of a project life cycle and the characteristics of each phase

Skip to question 26.

Engineering Learning Outcomes

25. Which learning outcomes you believe you have fulfilled?

Check all that apply.

- Describe and refer to different methods and approaches to integrated sustainable engineering design solutions
- Identify and explain the different practical implications of applied engineering design for a sustainable built environment
- Identify and explain the structure of a project life cycle and the characteristics of each phase of the CDIO methodology

Skip to question 26.

26. Any final comments?

Confirm that you have filled in this feedback survey in this spreadsheet: <http://bit.ly/2xB9Qzv>

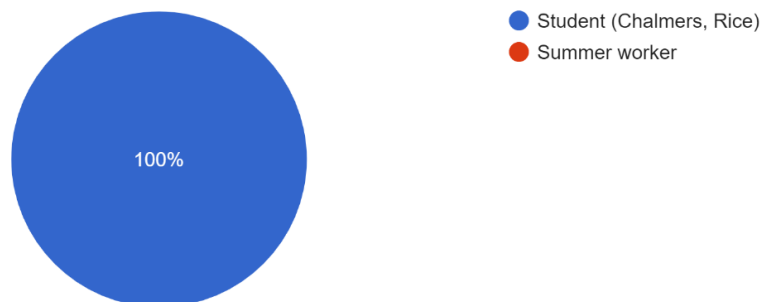
You just need to search your name, and change the corresponding "No" to "Yes". If your name does not show up in this list, contact me through Whatsapp (+351 934 702 213) or Facebook.

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PARTICIPANTS' SURVEY ANSWERS (13 RESPONDENTS OUT OF 30 PARTICIPANTS)

You are a...

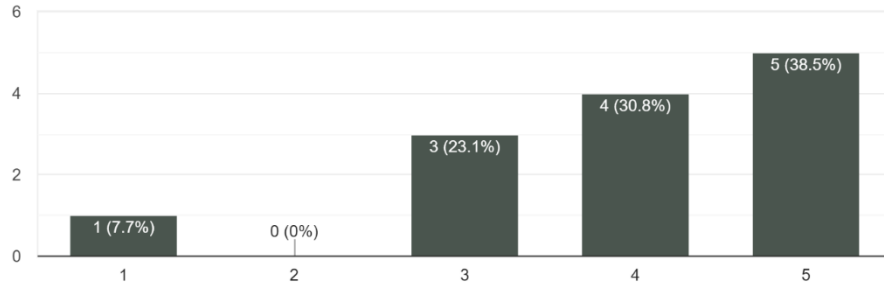
13 responses



Defining project objectives

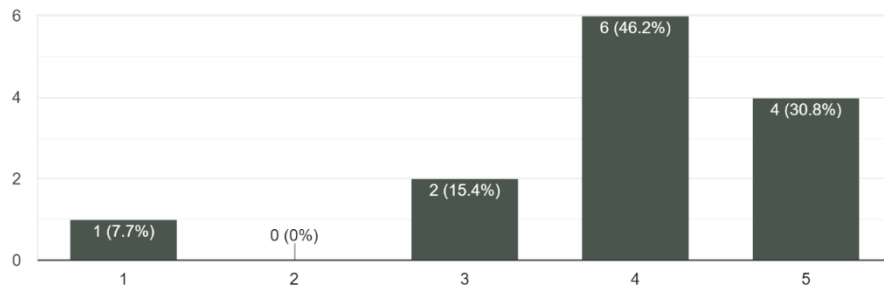
How helpful do you think it was to define project objectives (common to everyone, despite being part of different teams)?

13 responses



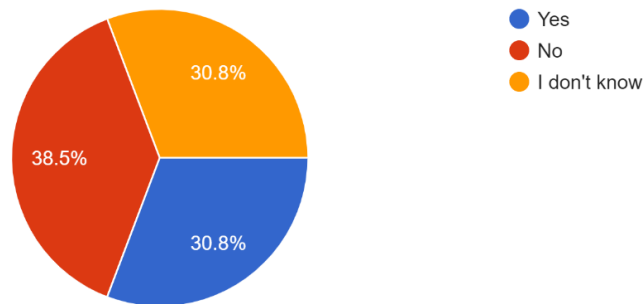
How helpful do you think it was to define project objectives alongside teachers and other participants (stud...nother field and/or summer workers)?

13 responses



Do you think other stakeholders should have been involved?

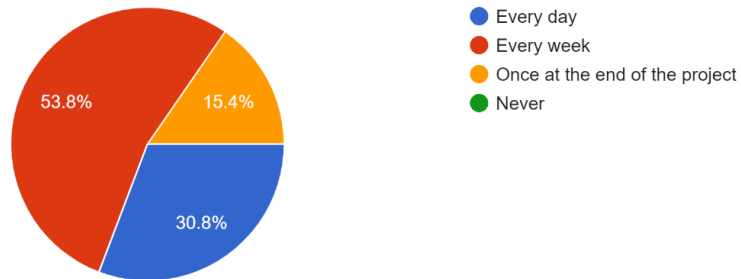
13 responses



Daily Evaluations

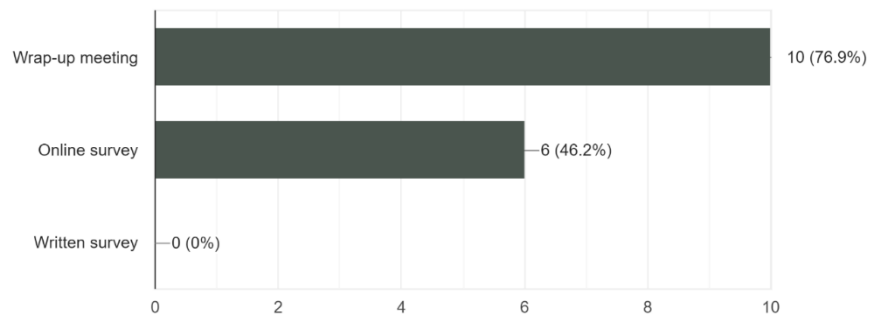
How frequently do you think it would be the most appropriate to do such an evaluation?

13 responses



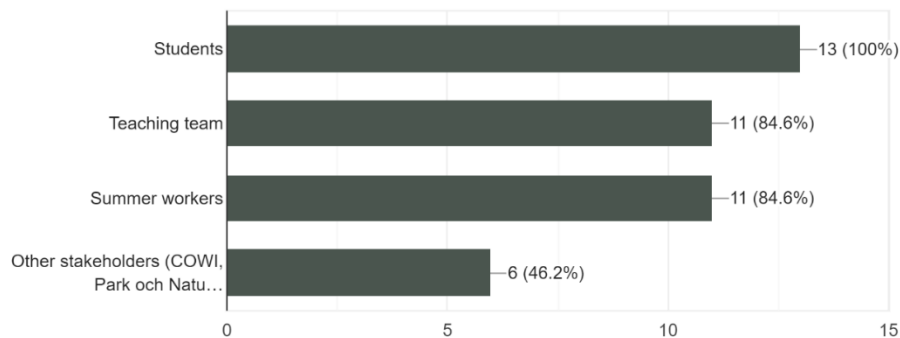
What format(s) would you deem useful to continuously evaluate the parameters above during the project?

13 responses



Who do you think should participate in such an evaluation?

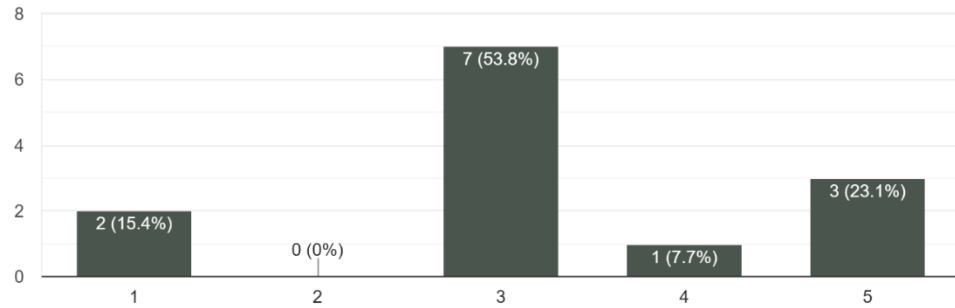
13 responses



Objective Tracking

How helpful do you think it was to fill in the objective tracking sheet?

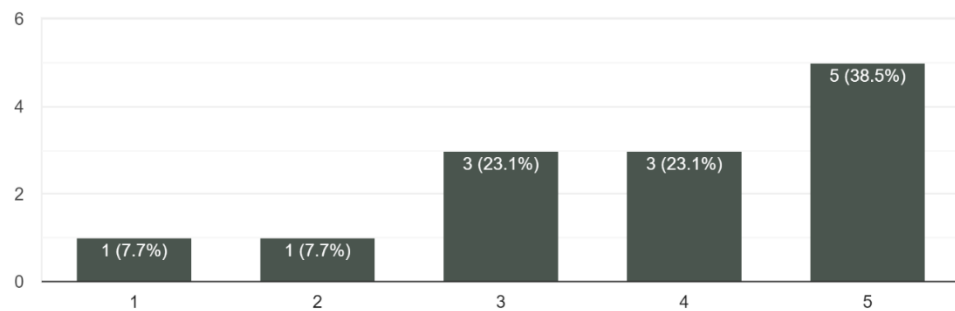
13 responses



Daily Logs

How helpful do you think it was to use daily logs?

13 responses



Framework Application ~ Feedback Survey

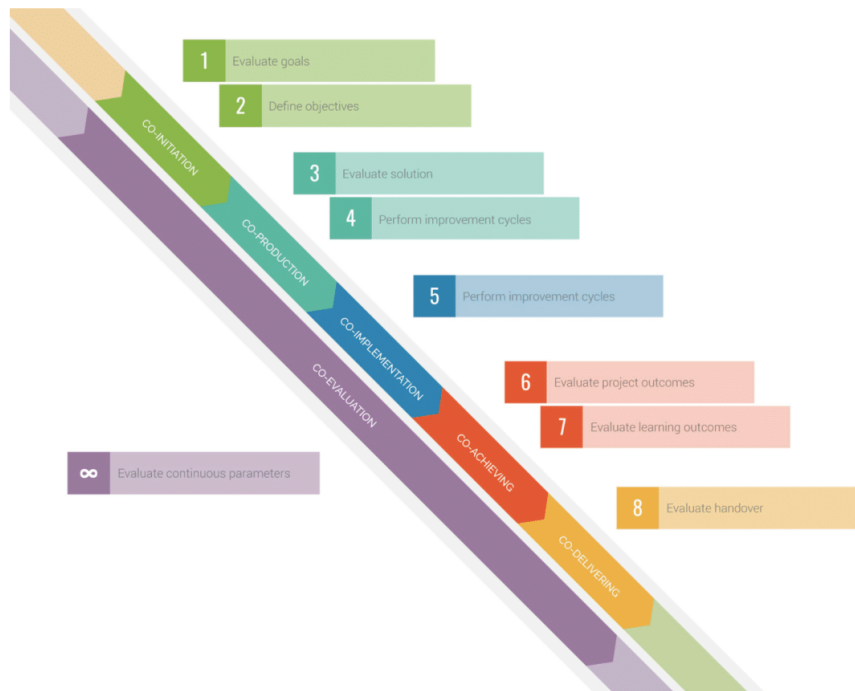
This form will take 15 minutes to fill in. Your help is very important for this research. Please be clear and honest in your answers.
Thank you for your collaboration!

CO:val, a co-evaluation conceptual framework

The co-evaluation tools applied during this D2B course were based on a literature-based conceptual framework, as part of this research. The framework consists of a delimitation of the different phases of a co-creation process, attributing to each phase a number of evaluation stages (as can be seen in the figure below).

During Dare to Build, the following stages were implemented:
0 Evaluate continuous parameters (Daily Evaluations)
1 Evaluate goals (Online form - Evaluating the main goal)
2 Define objectives (Workshop #1)
5 Perform improvement cycles (Daily Logs + Objective Tracking + Workshop #2)
7 Evaluate learning outcomes (Daily Evaluations + Framework Evaluation)

You can read more about the adopted methodology in this draft document (not a final version):
<http://bit.ly/2xw5CZZ>



Evaluating the main goal

Participants and teachers were asked to fill in an online form in order to evaluate the main goal of this project. The aim was to assess the students' and teachers' perceptions and opinions regarding the initiation phase. You can check the results of this survey here: <http://bit.ly/2FL3fHb>

1. How relevant do you think it was to enable a co-evaluation of the main goal of this project?

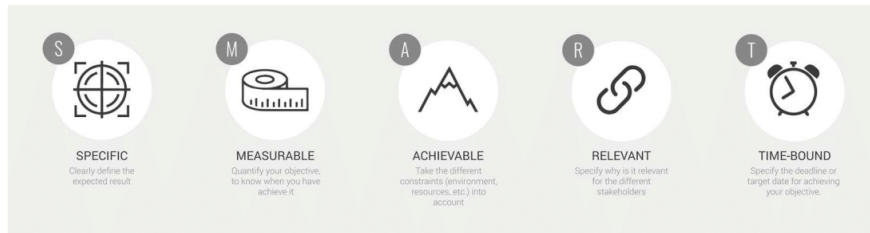
Mark only one oval.

	1	2	3	4	5	
Not relevant at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very relevant

2. Elaborate on your previous answer.

Defining project objectives

In this workshop, participants and teachers were asked to define together the project objectives. The S.M.A.R.T. criteria (as shown below) were used to defined them. You can check the session outcomes here: <http://bit.ly/2ROHdbI>



3. How relevant was to define project objectives (common to all teams)?

Mark only one oval.

1 2 3 4 5

Not relevant at all Very relevant

4. Elaborate on your previous answer.

5. Do you believe other stakeholders should have been involved in this?

Mark only one oval.

Yes

No

6. Elaborate on your previous answer.

Daily Evaluations

The Daily Evaluations consisted of a survey that students had to fill in daily. The questions were based on ten out of twelve evaluation parameters (described below). You can check the overall results in this link: <http://bit.ly/306O6aW>

Evaluation Parameters

In order to formulate the questions used in this daily evaluation, ten out of these twelve parameters were used (all but Acceptability and Appropriateness). They are part of this co-evaluation framework, and are meant to translate the different principles of co-creative processes.

EVALUATION PARAMETERS

PARAMETER	DESCRIPTION	EXAMPLE QUESTIONS
ACCEPTABILITY	Attitudes towards the initiative, satisfaction, receptivity	<i>Do you look forward to the changes that the project will lead to? Do you expect the project to bring about positive outcomes?</i>
APPROPRIATENESS	Perceived fit of both the co-creation process and planned goals and objectives, relevance	<i>Is the project relevant to the context where it will be implemented? Does this project meet your personal learning goals?</i>
CAPACITY BUILDING	Harnessing and improvement of skills, knowledge, tools, equipment and other resources needed	<i>What capacities do you need to put this project into place?</i>
DIRECTION	Awareness about which tasks to perform; awareness of how the work being done is related to the main goal and objectives	<i>Is it clear to you what you should do? Is it clear to you how the project is related to the main goals and learning objectives?</i>
INCLUSION	Involvement from the community and other actors, diversity	<i>How involved was the community in this process?</i>
KNOWLEDGE	Use of knowledge from the different actors and relevant people	<i>In your opinion, was the knowledge of relevant stakeholders taken into consideration? Who do you think needed to be consulted for this stage?</i>
ITERATIVITY	Building on successes, learning from mistakes, making midcourse corrections	<i>Have you had the opportunity to trace back to some mistakes done and make an improvement?</i>
OWNERSHIP	Value given to stakeholders' control and their feeling of ownership over the progress of the project	<i>Do you feel any ownership for the work you have performed so far? Why?</i>
SUPPORT	Support received and given by the stakeholders participating in the project	<i>Have you been given enough information about what is expected of you? Have you been given enough support to perform all the activities?</i>
COMMUNICATION	Promotion to the community, connection with the stakeholders	<i>Have you been informed about this project? How would classify the promotion among the community?</i>
ALTERATIONS AND DEVIATIONS	Translation of initially co-created plans into the actual activities, changes made and reasons why	<i>Are there already some differences between the initial proposal and what you have accomplished so far?</i>
CONTRIBUTION	Contributions from all levels	<i>How did I participate? Did I make myself included? Did I always contribute with X?</i>

7. How relevant do you deem these evaluation parameters?

Mark only one oval.

1 2 3 4 5

Not relevant at all Very relevant

8. Elaborate on your previous answer.



9. How frequently do you think it would be the most appropriate to do such an evaluation?

Mark only one oval.

- Every day
- Every week
- Once at the end of the project
- Never

10. What format(s) would you deem useful to continuously evaluate the parameters above, during this project?

Check all that apply.

- Wrap-up meeting
- Online survey
- Written survey
- Other: _____

11. Who do you think should participate in such an evaluation?

Check all that apply.

- Students
- Teaching team
- Summer workers
- Other stakeholders (COWI, Park och Natur, community members, etc)

12. Any comments?

Objective Tracking

The Objective Tracking sheet was displayed under the site's whiteboard. The coordination team checked the days for each they had contributed for a certain objective, in order to track what objectives were being neglected, were being worked upon, etc. Identifying the objectives that were being neglected could alert the daily coordination team to either start acting or cancelling the objective.



13. How relevant do you think it was to fill in the objective tracking sheet?

Mark only one oval.

1 2 3 4 5

Not relevant at all Very relevant

14. Elaborate on your previous answer.

15. How would you have done it differently?

Daily Logs

The following questions pertain to the four different types of daily logs used: a general daily log for the project planning, a daily log for the Communications Officer and the Food and Fika Responsibles respectively, and a safety log where the Safety and Efficiency Officer recorded any dangerous behaviour and practices as well as injuries.



16. How relevant do you think it was to use daily logs?

Mark only one oval.

1 2 3 4 5

Not helpful at all Very helpful

17. Elaborate on your previous answer.

18. What is your opinion on the time that was spent filling these in?

Mark only one oval.

1 2 3 4 5

Almost no time at all Way too much time

19. What would you improve about them?

Midterm Evaluation

A workshop that took place on June 27th 2019 served as a midway check for the state of the project. On a first stage, participants and teachers were asked to write down individually for each objective the tasks that were done, ongoing and the ones that were yet to be done by the time of the workshop. After this, students and teachers were divided into groups and they were assigned an objective. The groups were asked to write a course of action for each objective, based on what was listed.



20. How relevant do you think it was to do this activity?

Mark only one oval.

1 2 3 4 5

Not relevant at all Very relevant

21. Elaborate on your previous answer.

22. Any final comments?

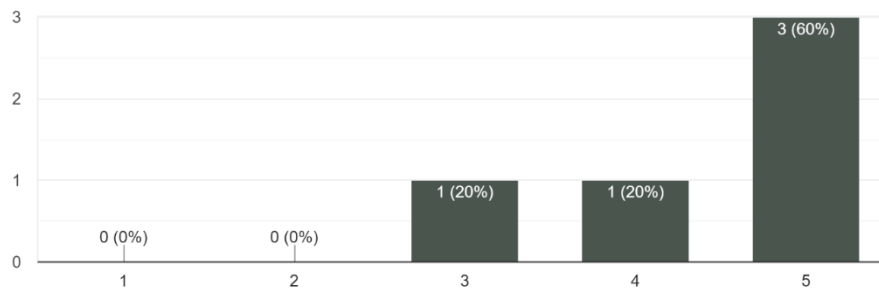
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TEACHERS' ANSWERS (5 RESPONDENTS OUT OF 8 MEMBERS)

Evaluating the main goal

How relevant do you think it was to enable a co-evaluation of the main goal of this project?

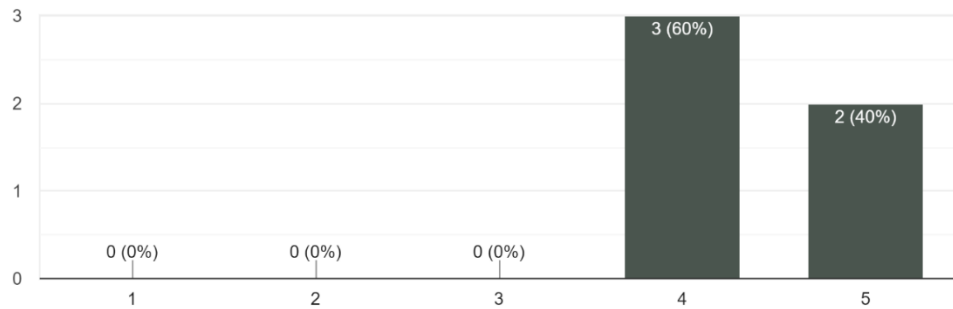
5 responses



Defining project objectives

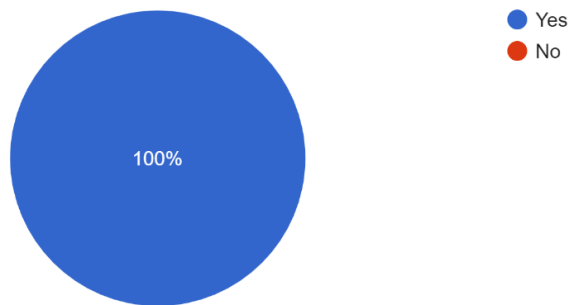
How relevant was to define project objectives (common to all teams)?

5 responses



Do you believe other stakeholders should have been involved in this?

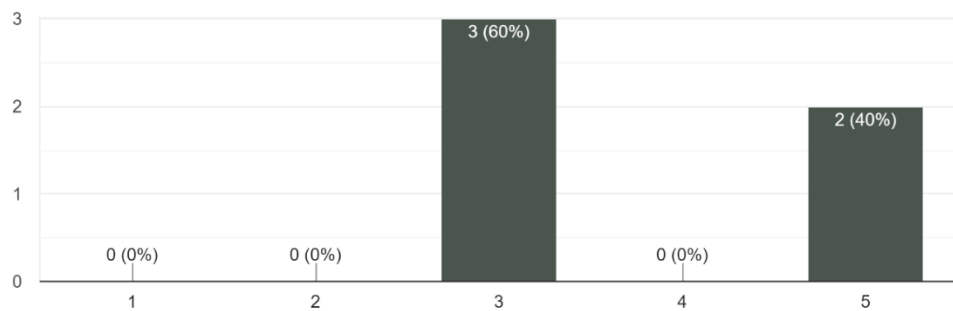
3 responses



Daily Evaluations

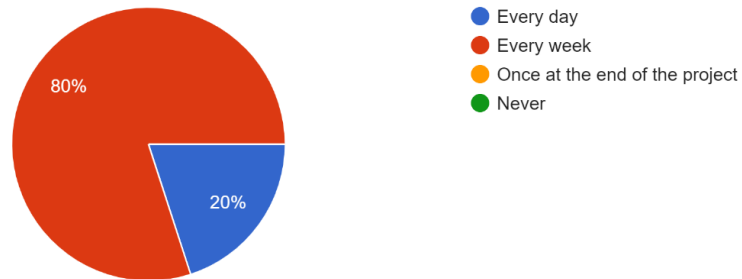
How relevant do you deem these evaluation parameters?

5 responses



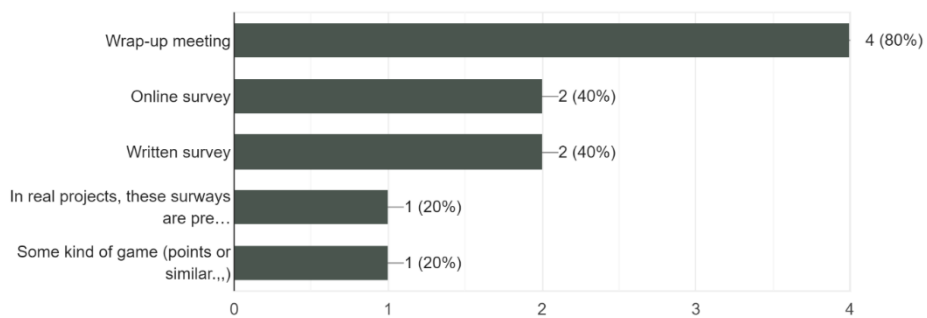
How frequently do you think it would be the most appropriate to do such an evaluation?

5 responses



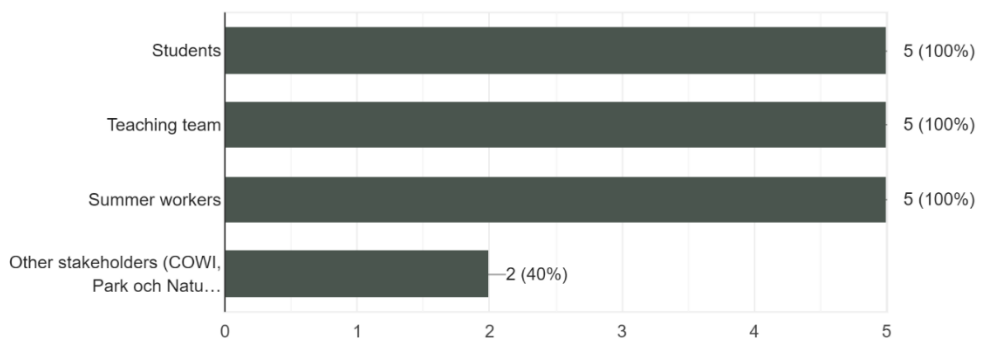
What format(s) would you deem useful to continuously evaluate the parameters above, during this project?

5 responses



Who do you think should participate in such an evaluation?

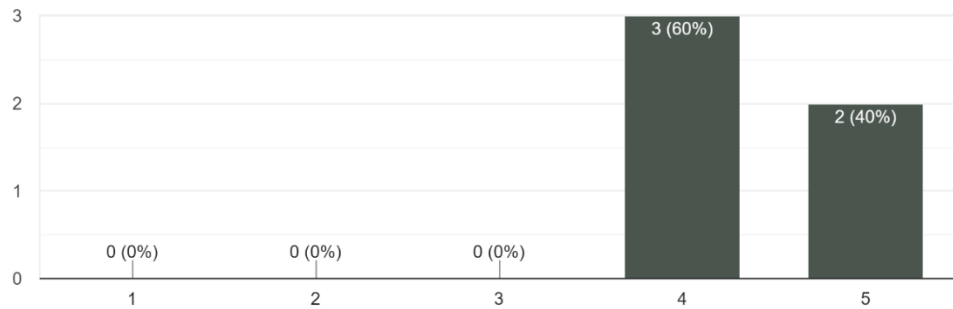
5 responses



Objective Tracking

How relevant do you think it was to fill in the objective tracking sheet?

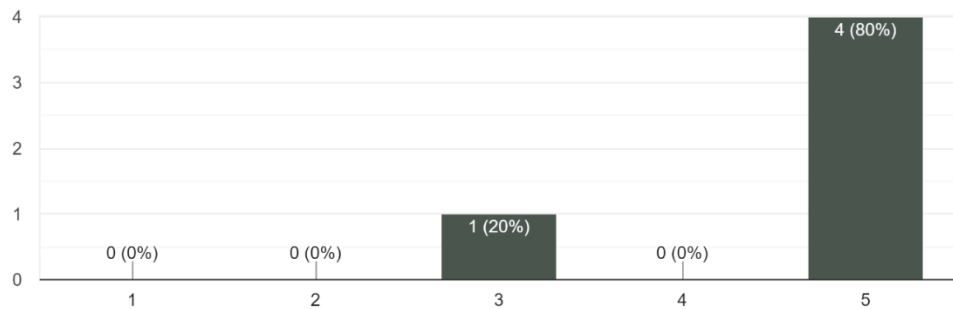
5 responses



Daily Logs

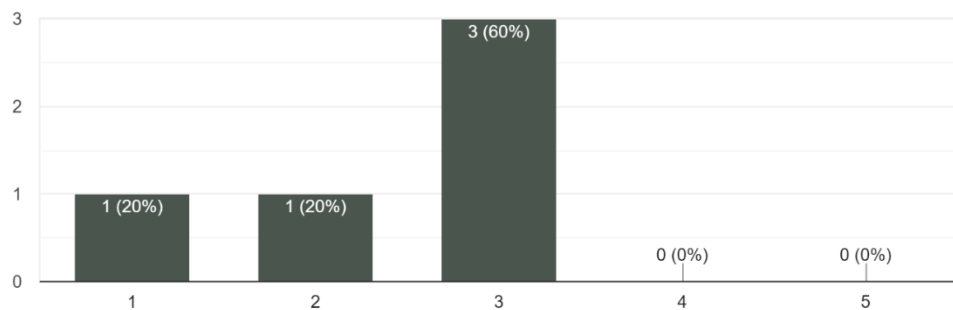
How relevant do you think it was to use daily logs?

5 responses



What is your opinion on the time that was spent filling these in?

5 responses



Midterm Evaluation

How relevant do you think it was to do this activity?

5 responses

