Earthy textiles. Experiences from a joint teaching encounter between textile design and architecture

Paula Femenías[a*], Kristina Fridh[b], Margareta Zetterblom[c], Svenja Keune[c], Riika Talman[c], Erica Henrysson[a], Klara Mörk[a]
[a] Department of Architecture, Chalmers University of Technology, Gothenburg, Sweden
[b] Academy of Design and Crafts (HDK), University of Gothenburg, Sweden
[c] The Swedish School of Textiles (THS), University of Borås, Sweden
*Corresponding author e-mail: Femenias@chalmers.se

Abstract: This paper presents experiences from a two-day teaching workshop where first year students in architecture meet with first year students in textile design for an assignment on building structures with textile, soil and plants designing for indoor gardening with the aim of inspiring for more sustainable lifestyles. The background is a research project on textile architecture with the objective of exploring this new field and to establish a platform for long-term collaboration between the disciplines of architecture and textile design. The paper addresses pedagogical challenges in the meeting between first-years students of different disciplines and traditions, but also in the meeting between research and undergraduate teaching. The students produced creative results but had difficulties in exploring the full complexity of the task. An evaluative discussion is based on observations, photo documentation, notes during group discussions, follow-up questionnaires among the students and reflections among involved researchers.

Keywords: Textile design, architecture, indoor gardening, teaching workshop, bachelor students

1. Introduction

1.1 The research context

The unexplored synergies between textile design and architecture was the starting point for a joint project that was granted funding 2016 to 2018 through the Swedish Research Council programme for Artistic Research. The project "Urban Materiality – Towards New Collaborations in Textile and Architectural Design" brings together three design institutions: HDK – Academy of Design and Crafts, University of Gothenburg and Chalmers University of Technology, the Department of Architecture, and The Swedish School of Textiles, The University of Borås. The theoretical part of the

project examines, question and interpret the field of textile architecture. The empirical part focuses on the development of experimental prototypes (i.e. samples, mock-ups, contextual architectural models and drawings).

The relationship between the making of design and the decisions taken during the process are fundamental tools in the practice-based research as well as the meeting between theoretical and practical, making, approaches. The aim is to contribute to the development of design methodology that derives from collaborative processes delineating structures formed by textile design and architecture as well as to establish an interdisciplinary platform for continuous exchange and collaboration in research and teaching between textile design and architecture. The framework proposed in the project contributes to the development of design methods derived from an artistic, collaborative and generative process that delineates structures formed by the participants' fields of competence.

The primary field for experimentation is urban environments, an area where textile design is less practised. Central to these explorations is the creation of "textile disturbances"; imperfections and the unexpected that could bridge consciousness and matter, in a process of creating wonder. One background to that perspective is current aesthetic ideals of perfection which can be questioned with reference to more sustainable architectures, as ideals of perfection demand for constant maintenance and lead to premature replacement of materials and components.

1.2 Theory and method

As an initial activity to develop a long-term exchange between textile design and architecture, a joint teaching workshop was developed and tested. The workshop explores a meeting between two schools of design and architecture, and two traditions of teaching but also the meeting between research and undergraduate students. The workshop consisted of a shorter two-day workshop arranged as part of two existing courses with first year bachelor students in textile design and architecture. The first meeting will be evaluated as a basis for developing future joint teaching activities.

The assignment for the workshop was to explore solutions for indoor urban farming for home or work-place environments in a bid to reduce environmental impact from food production but also to inspire users to more environmental lifestyles by making natural eco-cycles tangible in daily life. The assignment includes the design and practical creation of a structure for indoor farming which also should be able to delimit a space. For the spatial part, the task was to create solutions to delimit different spaces in the studio where the architect students work. The workshop itself was only two days but the assignment includes the maintenance and documentation of the evolution of the indoor farming in the architect students' studio during the whole spring semester 2017.

Our pedagogical ambition for the workshop was to challenge the students to use new approaches, and materials, to exchange perspectives with students from another discipline and to work hands-on with sustainability in this case urban agriculture. Textile as a matter is an unexplored material among students of architecture as is spatial design for the textile design students. There are also differences in the approach to how design is taught between the disciplines. Textile designers are used to work hands-on with material and mock-ups while architects mainly work with drawings, visualisations, models and representations of reality. For the architects the societal relevance is always present. Architectural teaching is increasingly challenged to embrace the complexity of modern society (Salama, 2016). Sustainability is one of them, digitalisation another. Architect students are taught to program their designs and to switch perspectives going from detail to the larger societal perspective and back again in an iterative process. A result of a process of "academisation" of architecture as a discipline, theory and method are often taught disconnected from studio work (Kurath, 2015). Practical skills such as hand drawing, model work and crafts have been compromised for other knowledge areas and material knowledge is increasingly lacking among architect students (Bell & Rand, 2006).

The education of textile design is also in a process of embracing more academic approaches. From being taught mostly as a field of practice, in the past decade, existing models of teaching has been challenged to shift from teaching textile design to textile design thinking (Dumitrescu, 2016), from tacit knowledge to training for design rationale (Kunz & Rittel, 1970). The textile students are challenged to reflect on their design explorations and to get critical perspectives on their design before they start to produce full scale mock-ups.

Teaching sustainability is a challenge in itself addressing complex problems with no simple solutions. We take our starting point in definitions of sustainability that emphasize on environmental protection and social justice (Raworth, 2012). Pedagogical literature highlight the importance of transformative learning (Lange, 2009; Widhalm, 2010) or regenerative ways of teaching (Hauk, 2011). Teaching should favour the realisation of pluralistic and interdependent dynamics between humans, society and the natural environment, be based on direct encounters and experiences with real life problems, and reach for emotional transformation through the students' *"hearts and souls"* (Widhalm, 2010). Expressive ways of knowing are suggested, using art, movement, storytelling, and self-audits but also cross-disciplinary encounters and teamwork.

The workshop was intended as a place for observations and comparisons of similarities and differences between the students with respect to approaches, background, cultures and identities.

An evaluation was planned based on observations, photo documentation, notes during groups discussion, follow-up questionnaires among students and reflections among involved researchers. The research questions are defined as:

- What was the overall outcome of the cross-disciplinary encounter? How did the students manage the teamwork?
- Could differences in the approach to the assignment between the students be observed?
- Did the results from the assignment demonstrate a synergetic effect from the collaboration?
- Did the students find the meeting and the workshop enrichening for their development as textile designers and architects?
- What can be learnt for developing future teaching exchanges between the disciplines?

2. Presenting the two courses

2.1 Textile design: Form and material I

Form and material I: Expression and structure is a 15 credits course at the Swedish School of Textile that aims at developing the textile design student's ability to give form to textile material through colour, construction and material. The course is given for the fifteen first-year students in textile design, all of whom have entered the programme through practical entrance exams including a portfolio, solving a task during an exam day and an interview. The course consists of a series of workshops with hands-on assignments on various topics exploring concepts such as line, direction, volume, form, texture, perspective, scale, two dimensions and three dimensions in textiles. The teaching is driven in the form of practical work, lectures, supervision and seminars. The course involves an individual reflection over the work and methods used in the form of a workbook where the whole design process is documented. Theoretical studies during the course include material science and colour theory with their separate exams

The workshop "Earthy textiles" is one among several during the course. It aims at questioning and redefining the aesthetics and management of interior landscaping, based on textile structures and soil

as a fundament for living materials such as plants (Figure 1). The meeting with the architect students is a shorter event during a longer workshop. The workshop is supervised by doctoral student and textile designer Svenja Keune. Svenja has given inspiration for the workshop through her own work (Figures 1 and 2 to 4).

The thematic "Earthy textile" is designed as a response to current development of flexible systems that allows for cropping and harvesting of plants and vegetables for food as part of interior living in dense urban areas – as new solutions to gardening. References are given to contemporary examples of urban farming but also to "biophilia" (Wilson, 1984) and biophilic design searching for emotional affiliations of human beings to other living organisms. The workshop aims at questioning the relation between nature (vegetation), the built environment and humans opening new research perspectives in regard to materials, plants and processes of growing and harvesting in interior spaces.

Figure 1a and 1b. Ongoing work by Svenja Keune "Earthy textiles".

Preceding the joint workshop, the textile students were active with sketching on solutions for urban farming as well as making material tests. Before the joint workshop, the textile students were encouraged to take a step back and come up with modular solutions that could be used as bases for building up larger structures together with the architect students. After the joint workshop, the textile students will continue on their individual design which might be give a new direction.

2.3 ARK253, Architecture, environment and sustainable development

ARK253 is a 7,5 credits introductory course in sustainable building given at Chalmers for the first-year architect students. The course is attended by 80-90 students with a varied background in terms of earlier experiences. Up to 40 % of the students enter the school of architecture on practical tests and the rest on notes from college.

The course is structured around lectures, seminars, workshops and essay writing, and introduces the students to a broad overview of sustainability aspects. In the first weeks, thematic seminars accompanied with hands-on workshop give the students the possibility get acquainted with four aspects of sustainability: social & ethical aspects, materials & resource use, energy use and green & blue structures. Further, the students will make a shorter written assignment in which they are allowed to go deeper in one subject or question. Emphasise is on retrieval and critical analysis of information and literature as well as studies of current examples of sustainable building. The course aims at supporting an awakening process of personal identification and reflection in relation to more sustainable architectural design. The course is wrapped up by the writing of an individual intent on their personal view of sustainability to be used as a 'programme' for an up-coming studio called *Space for dwelling* in which they will design a detached housing unit. The joint workshop is given as part of the thematic green & blue structures and the outcome could give new input for the dwelling design.

3. The workshop

3.1 A preparatory meeting

The workshop was introduced to the two groups of students two weeks prior to the event at a joint meeting at Chalmers University where the students could socialise around a coffee. The textile design student had also brought their preliminary design and material experimentations which were exposed on a table to the architectural students. There was a lecture about the research project "Urban Materiality" and Svenja Keune gave some inspiration for farming structures where she had used woven textile in which earth, seeds, plants and even watering systems can be installed (Figure 4) and knitted tubes (Figure 5 and 6) which can be filled with earth and in which seeds or plants can be cultivated. The intention was that the architect students should prepare for the workshop two weeks later on their own by reflecting on what they wanted to do and gather some material. No specific time were scheduled for the architect students to prepare for the workshop as they worked on other topics in parallel.

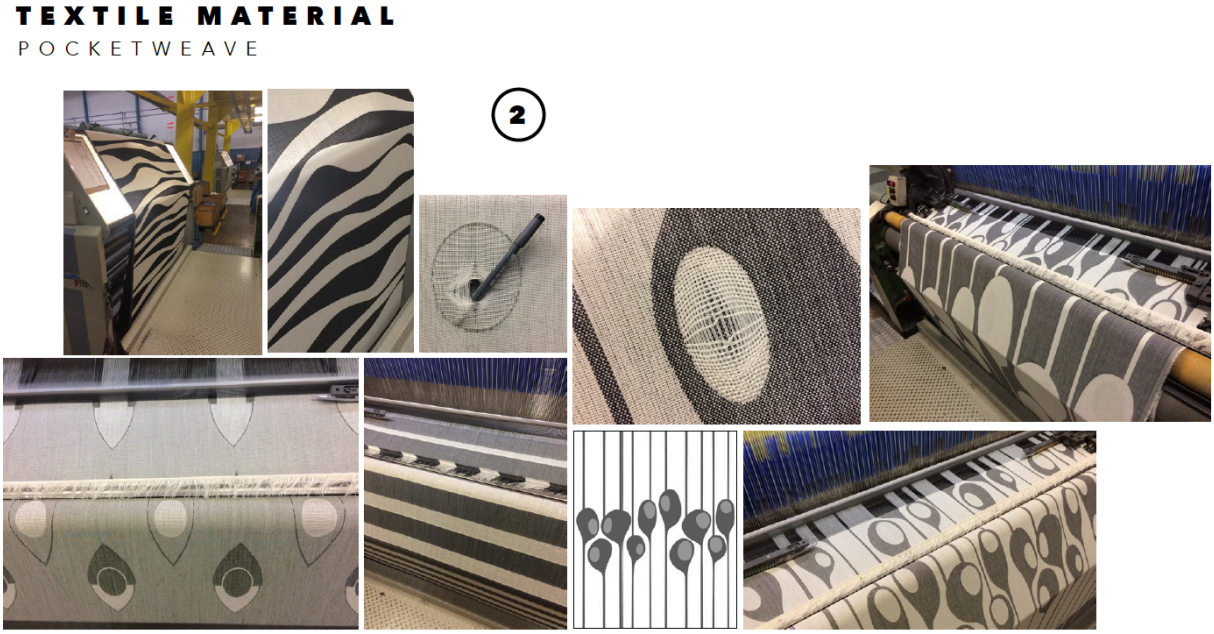

Figure 2, Example of design solutions that can be used for urban farming produced by Svenja Keune

Figure 3, Example of modules of textile that can be used for indoor gardening, work by Svenja Keune.

Figure 4, Inspiration for producing plant containers by Svenja Keune.

3.2 The material library

In the morning of the first day the students had two lectures on more general topics relating to green and blue structures in urban planning, and specifically on indoor urban farming. The lectures were followed by a repetition of the aims and the organisation of the workshop (Figure 5). The workshop basically had three stages: design concept, construction and reflection & evolution. The evolution includes the continued maintenance of the structures. The "Earthy textiles" should be installed in the work space of the architect students and they should be responsible for taking care of the structures, water them and document how the seeds or plants grow within the textile structures. For the documentation part a card was to be filled out with expected transformations of the design and

updated over time. A polaroid mobile printer was provided so that the students could complete their notes with photo documentations.

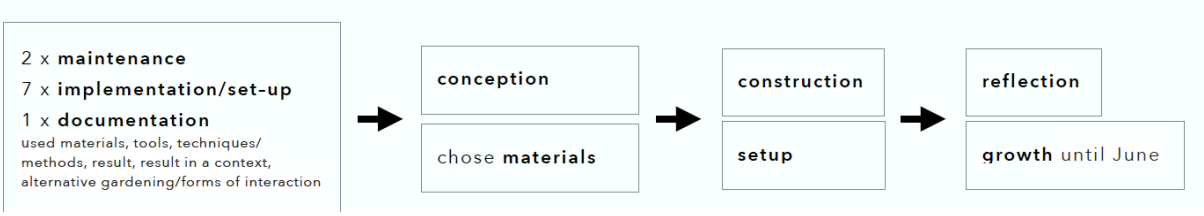

Figure 5, The layout of the workshop. The intention was that the students should divide their work with two students responsible for the maintenance of the structure including watering, one responsible for the documentation of the design process and the rest should implement/set-up the structure.

The place for the workshop was Chalmers University of Technology. Three different rooms were available: the art studios where a material library was set up, a large hall for experimentation "the concrete hall" and the working space studio for the bachelor students. The material library (Figure 6a and b) consisted of different textiles: raw textiles, textile produced by Svenja, textile tubes in different colours, and some textile modules produced by the textile design student in their course. Furthermore, there were earth, perlite, Leca pellets, pots, cultivation briquettes, seeds, plants, pipes, plastic bottles and different kinds of rope. For the students' disposition, there was also a sewing machine. The workshop started with the students getting acquainted with the materials. The architect students had the possibility to ask the textile students about their modules and Svenja about her fabrics.

Figure 6a and 6b: The students getting acquainted with the material library and the larger textile 6a, and 6b, example of pockets and modules created by the textile students prior to the workshop.

3.3 Starting to design and forming groups

The students were first given time for individual sketching so that everybody would had the chance to develop their own ideas before the group work started. The time for individual sketching was a bit less than one hour. A few "research questions" had been defined to lead the students in their work:

1. How to implement seeds/plants and substrate into textile structures?
2. How do these structures look like?
3. How do they form a spatial experience?
4. How will the structures be watered and taken care of (until June)?
5. How do humans, structure and space interact with one another?

The student groups consisted of 78 architect students and 15 textile design students. The first plan was to divide the students in ten groups with one or two textile students and seven to eight architect students. However, only twelve textile students were present at the workshop and they preferred to work in pairs. Instead six larger groups were formed with two textile students and twelve to thirteen architect students. The groups were too large to function and some divided into smaller groups. Some students had started discussions of a common idea over lunch and wanted to remain in separate groups.

The groups started to engage with the materials rather quickly. Some groups moved up to the architect students' work space while some remained in the "concrete hall". Several groups seemed almost ready with their design on the first day and used the second day to plant seeds. Most groups decided to put the seeds and plants after they had finished the whole structure not at the same time as the earth was put in, as we had expected.

4. The final structures

In the end ten group designs were made, here we shortly present a smaller number.

4.1 The "intestinal lavage"

This group were inspired by the yellow knitted tubes which changed colour to an almost fluorescent green when filled with earth. Two bottles were added at the top to water the structure. The group remained in the concrete hall to carry out the project then moved it up to the architect studio.

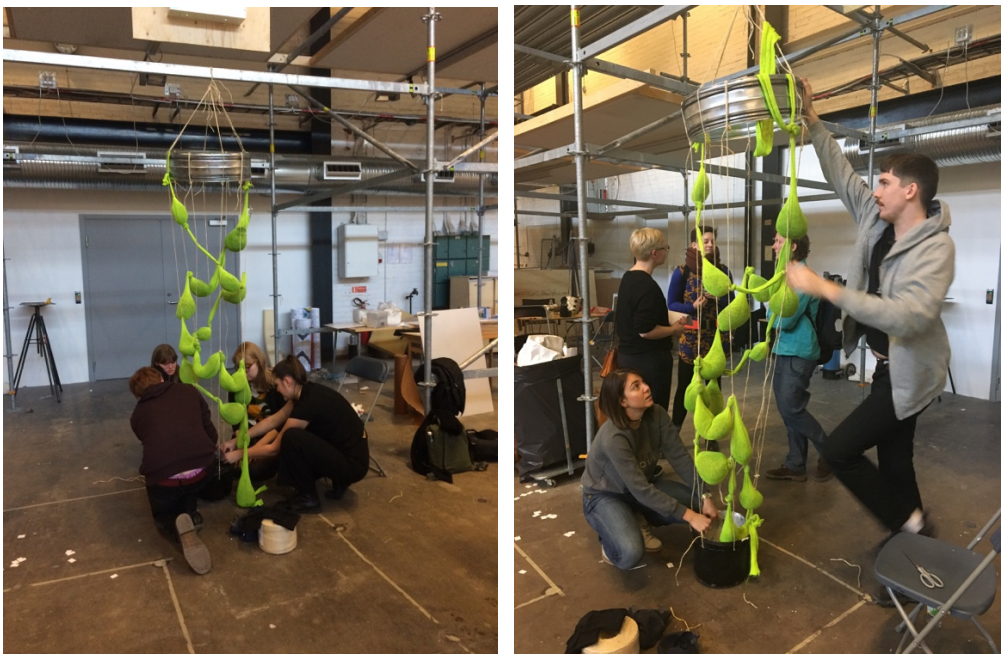

Figure 7a and7 b, the student group working with the "intestinal lavage".

4.2 "No name 1"

This structure was installed in the architect students' work space. It was created with a grey tube filled with earth and perlite. Plants and seeds were added after the structure was installed.


Figure 8a and 8b, the installation of No name 1.

4.3 “No name 2”

This project was realised using one of Svenja’s fabrics. Double layers in the fabric were filled with earth and perlite during coordinated and hard team work. The group had difficulties to find a suitable structure to hang up the fabric.


Figure 9a and 9b, Project “No name 2”, using one of Svenja’s fabrics.

4.4 “The grid”

This groups based their design on fabric pockets that one textile student had brought. Another group did a very similar project but added tubes in the hanging line for watering.

Figure 10a and 10b, project "The grid".

4.5 "Intestinal flora"

Intestinal flora was created by a red tube filled with earth. The project was realised in the concrete hall and then moved up to the architects' work space. There was a lot of dripping of water initially so the realisation of the project would have been difficult in the architects' work space.

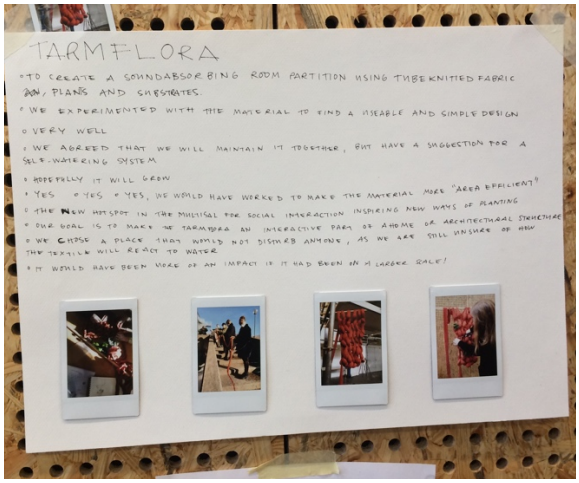

Figure 11a, 11b and 11c, The "intestinal flora"

4.6 "No name 3"

Some groups made small individual devices without any spatial dimension at all, as this group no name 3. The group engaged quickly with the material and by the end of day 1 they felt ready. When approached and asked whether they could create a larger more spatial structure they actually took a step back and managed to link the smaller devices to a larger although in a rudimentary way.

Figure 12a and 12b, installation of "No name 3"

5. Feedback from the students

5.1 Feedback from the textile students

An on-line survey was sent out to the textile students shortly after the workshop and a group discussion was held three days after the workshop. On the whole, the textile design students were very positive to working with the architecture students and would like to collaborate in the future, also with other design disciplines and universities.

What they had wished was more time to work together and that all students should start from the same point. The textile students felt that as they had already been working with the topic longer, they had come further into the process than the architecture students who came to the workshop more unprepared. While the textile students were ready to go up in scale and work with more experimental and spatial structures the architecture students were still on the prototyping stage making small flower pots. They also found it problematic that they had not visited the architect students' working place before the workshop. They would have liked to prepare for example by studying movements and spaces. As the architect students share the space with other students in the second and third year, they were also worried to disturb the others. The result was that they more or less choose the first available spot.

The textile design students felt that they would have needed more time to meet with the architecture students before the workshop to get to know them and how they think. The groups were also too large to be able to work efficiently. The textile students did not feel quite comfortable in the group work. They felt that they could not influence or contribute enough to decision making. They would have liked to have a longer workshop, at least one day more so that they would have had time to experiment and realise more ambitious ideas. They said some of the architecture students had good ideas that they did not pursue simply due to time.

The modules that the textile design students had prepared and brought to the workshop were not used much, apart from some pockets. The textile students had expected the modules to be used more, perhaps combined in different ways. They felt that their work, which they had put a lot of effort into to finish in time got a bit lost on the table with all the other materials. The architecture students seemed to have seen the modules as finished products and did not add much to them. The textile designer's

works and concepts could have been more thoroughly introduced to the architecture students. Here are three statements by textile students:

> "I was disappointed by the fact that all the materials were mixed which meant a lot of things weren't even used. We put a lot of work and time into these materials and stressed to get them ready in time."

> "Our modules were not used because they were already made. The architecture students did not use them because they were like already finished. They thought they were boring to use. So, the time we put in producing them were wasted."

Finally, the textile students observed some differences in working methods. They felt that they worked more experimentally, directly trying things out in the materials. The architecture students worked more with sketches and scenarios, some of which were very experimental and interesting but never realised as they thought they could not do it. The textile students found the architect students to be more systematic in their experimentation while themselves, they just tried something out. The architecture students were also perceived as much more practical, looking for solutions that they knew would work in practice.

5.1 Feedback from the architect students

An individual questionnaire was distributed to the architect students immediately after the workshop was finished. Unfortunately, there was a problem in the distribution and collection of the questionnaires and only fifteen filled in forms were received. However, the workshop was proceeded by a two-hour long discussion in five separate groups with all the students, and later by a one hour discussion with four invited student representatives. Notes from these discussions complement our feedback.

The architect students found the assignment exiting but complained about lack of organisation. They found it interesting to find new ways of using textiles and to experiment with greenery. The workshop was hands on and they liked to prototype. Approximately half of the group think that the workshop gave them new perspective to architectural design. Some architect students did not see the direct connection between the workshop and sustainability and found the assignment too simple to address larger societal questions. A majority thought that they had enough time for the workshop.

They found it interesting to meet with the textile students, but the short workshop did not give time for any real exchange. They would have wanted to be better prepared such as the textile students and have more time to discuss. The fact that they were less prepared made them look bad, said one student. Just like the textile students remarked, they recognise that they did not really use the modules that the textile students had prepared. Some perceived the textile students as unengaged, the fact that the structures were to be put in their studio place contributed to a distance to the textile students. The architect students had the impression that the textile designers felt that it was not their project. They themselves also felt intimidated to put their structure in the design studio. One group said that they put their design close up to the wall in order not to disturb.

They architect students also found that the groups had been too large to be functional and creative. Some of the architect students noticed that some of their fellow students did not actively participate in the team work but failed to engage them. The smaller groups seemed to manage the teamwork better. Regarding working methods, the architect students recognise that they should have made more prototyping before deciding to go for one solution.

6. Discussion and conclusions

The results from the workshop shows some creative design and the encounter between the disciplines seems to have been a positive experience even though more time should have been given for exchange and meeting. A second evaluation later on during the semester will tell us if the meeting left some trace that can be shown in the design the student produce after the meeting.

As regards the planning of the workshop, this should have been better planned. A prime lesson is that we had underestimated the task of getting the students from two disciplines to collaborate. There was an unbalance as the textile students arrived more prepared. The textile students felt that the work they had already put into thinking about modules prior to the workshop was not used. The architect students needed to prototype themselves with the material before being able to go up in scale.

The students clearly did not fully use neither the spatial scale nor the time given for the assignment. Several groups finished already the first day and the structures were rather small, flat and two-dimensional. The impression is that they wanted to keep it safe not exploring their full creativity. The architect students also focused a lot on the technical part, the watering and the maintenance system. In some structures this was the starting point for the whole design. Instead of going into creative explorations they seemed to have searched for a quick solution to a given problem. This might also explain why the students did not integrate substrates and seeds at the same time, but planted plants and seeds in their finished structures in the end. Maybe they were looking for a finished result to present at the end of the workshop not thinking so much of the time perspective and the whole lifetime of the structure.

Comments from the students show that the architect students had not fully understood the complexity of the task. The textile students were outnumbered and felt that they had difficulties taking a place in the decision-making. They also felt intimidated working with the architect students' place of work, and were seen as uninvolved by the architect students. The architect students also complained that they felt that the assignment did not relate to sustainability or architecture although they had lecture presenting the sustainability of urban gardening. The architect students of the first year are still searching for an identity as architects, and the assignment did not correspond to their idea of what sustainability is in the built environment. What they might not have realised is that collaboration and cross-disciplinary teamwork is one very important aspect of sustainability.

The students approach to keep it safe and to focus on solving a problem can be understood as an uncertainty of handling the design process. A majority, two thirds, of the architect students enter the school solemnly on high degrees. They are high-performing students used to be the best in their class and not all of them are used to work with artistic methods. This is different from the textile students who all enter the school on trials and earlier artistic work and used to show their sketches and material samples. The first-year architect students are still intimidated by exposing their sketches and ideas to a large group.

For future collaboration in teaching, our conclusion is that we should go for more mature students, on the master's level, post-graduate education or professional designers. There is a large interest in textile architecture among practicing architects that could be met with workshops.

Finally, the influence of the actual space where the workshop took place had been overseen in the planning of the workshop. The groups who worked in the studio space made flat structures and used neutral, grey or transparent textiles. The more creative structures were built in the concrete hall both in terms of form and use of colour. The architect students were worried to mess-up the space with water and dirt. Plastic bags had been provided to protect the carpet in the studio, and instructions had been given to be careful not to damage the carpet. The floor in the concrete hall is resistant to water and dirt contrary to the carpet in the architect students' studio. This factor could have been inhibiting for the exploration of the materials and the assignment in that working environment. One conclusion is that it

might had been wise to advise them to sketch in the design studio, talk about the possibilities to visually or physically delimit a space, then move down to the concrete hall to do some prototyping and build the structure.

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About the Authors:

Paula Femenías, PhD and architect, Associate Professor at The Department of Architecture at Chalmers University of Technology. Femenías researches strategies for sustainable built environments and specifically the link between architectural design, environmental performance and social progress.

Kristina Fridh PhD and architect, director of studies for the doctoral education and researcher in the Academy of Design and Crafts (HDK), University of Gothenburg. Lecturer in Design/Spatial Design in HDK 2003–2013. Research field: traditional and contemporary Japanese architecture and material/materiality.

Margareta Zetterblom PhD and textile designer, lecturer at The Swedish School of Textiles at the University of Borås and program director for the BA education in Textile Design. Research field: artistic research in Textile Design with specialisation in textile sound design.

Svenja Keune is a textile designer and doctoral student through Ludvig Svensson AB in Kinna, The Swedish School of Textiles at the University of Borås, and the ArcInTex European Training Network. Keunes' work is dedicated to the interfaces of art, design and technology.

Riikka Talman, textile designer doctoral student at The Swedish School of Textiles at the University of Borås. Talman project *Transient impressions* explores qualities and sustainability through changing processes and life-times of textile materials and people's relationship to these.

Erica Henrysson is an architect, engineer and doctoral student at The Department of Architecture at Chalmers University of Technology. Henrysson's doctoral work explores Moving Architecture - Flexible Structures and Wind.

Klara Mörk is an architect at Gap Actors also working as a research and teaching assistant at The Department of Architecture at Chalmers University of Technology.

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