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Form and Visualisation

Development, Implementation and Evaluation of an Integral, Foundational Imaging Study Program

Topics

Form Study Themes and Methodology; Thinking by Envisioning; Representational and Designerly Drawing; Physical and Digital Modelling; Visual Communication and Graphic Design; Integration and Evaluation.

Introduction

How should one go about creating a wholly new educational program – with the aim of furthering the understanding of architectural Form and the development of essential Visualisation skills – within strictly defined constraints, concerning the available study time and academic staff, plus a binding, interdisciplinary curriculum organization?

This Paper documents the thematic integration and thorough ‘re-design’ of pre-existing foundational courses into two ‘twinning’ first-year Bachelor teaching applications, with ‘Form and Visualisation’ as their guiding theme.

The challenge was set some four-and-a-half years ago, when the faculty’s (then) Dean decided to completely re-organize the existing Bachelor curriculum. The aim: to create an efficient and cost-effective integral study program, with clearly identifiable components and intellectually stimulating and creatively challenging new course concepts.

The consequences of the initiative were far-reaching and involved re-defining – and frequently re-inventing – teaching methods and -contents. All of the new BSc programs would be required to fit into a rigorous, top-down, three-year time-frame, whereby the subjects of wholly different disciplines (in our case: Building Technology and Architectural History & Theory), would need to be offered simultaneously, in parallel trajectories.

Whilst the ‘old’ program was still up-and-running, a busy half-year was spent developing a tightly organized conglomerate of interwoven educational modules. Then (some four years ago) the entire Bachelor curriculum was re-launched in one go: a logistically and pedagogically challenging operation, to say the least!

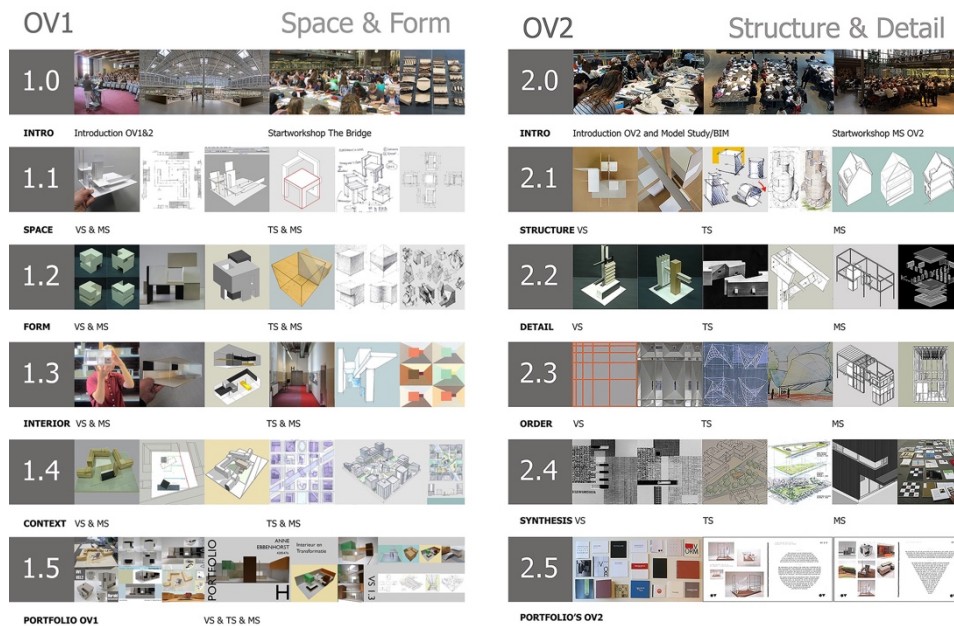


Fig. 01. Organisation overview of the two F&V (OV) modules.

Source: Jack Breen

Organisation

The new Form and Visualisation programme which was envisioned was to consist of three, interrelated ‘Modules’: two in the first year of study and a third at the beginning of the second year. The author was appointed as coordinator of the first two modules and was, initially, closely involved in the development of the third one, focusing on computational design and representation.

The first F&V module (subtitled: ‘Space & Form’) became one of the two modules that simultaneously kick-off the first Bachelor year as a whole. It takes up a third of the study-time of the first ‘quarter’, spanning ten weeks in all.

The second F&V module (subtitled ‘Structure & Detail’) takes place in the third quarter (from the beginning of the second half of the year), after Design Module 1 in quarter 2 and preceding Design Module 2 in quarter 4.

The third F&V module (subtitled: ‘Parametric Design’) is offered in the first half-quarter of the second BSc year. It became the full responsibility of the faculty’s Informatics group and is therefore not considered in the context of this evaluation of the – first year – Form and Visualisation programme.

The two first-year F&V modules were conceived and developed as a two-step, interrelated learning programme. The intention: to get new students to begin to appreciate and to recognize the fundamental compositional and perceptual phenomena of architecture, whilst at the same time getting them to develop essential creative- and analytical visualisation and communication skills. The further idea was that the two modules would contrite towards them developing

thematic insights and visualisation- and modelling skills that they would be able to apply in the next – design – modules.

Within these two F&V modules, three existing teaching disciplines were brought together organisationally, thematically and didactically:

- Form & Modelling Studies;
- Freehand Drawing;
- Informatics.

These disciplines have – as much as possible and indeed: desirable – been developed as thematically interrelated entities, whereby the original educational methods and cultures are still to a substantial extent recognizable within the three, newly determined F&V subdomains:

- Form Study (FS);
- Drawing Study (DS);
- Model Study (MS).

The first-year programme kicks off in week 1 with a collective workshop in which all of the students (and staff members) participate. In the set task – The Bridge – a thematic exchange is sought with the first ‘parallel’ module: Technology 1.

Form Studies

In the Form Studies programme at the Delft Architecture faculty, students are stimulated to start recognising fundamental themes on the level of composition and perception.

To trigger an on-going interest in the domains of form-giving, a series of brief (one half-day), but intensive designerly exercises has been developed, fine-tuned and perfected through the years. The content and didactics of the specific applications and the programme as a whole are continuously under scrutiny, whereby the ambition is to offer an eye-opening educational course that will stimulate further thematic explorations throughout the student’s further years of study and ... into practice.

The working-method in the tutored study-sessions is to offer all participating students a clearly-defined compositional task with constraints and specified study-products, on the basis of a given set of working-materials or situation.

The intention is that, during the lesson, the student gets regular feed-back from the group’s Form Studies Tutor and that the result of the spatial composition-study is completed and documented before the next guided session (in two weeks’ time), in self-study.

Each first-year OV module contains four specific Form Studies tasks, the result of each of which is an integral, physical study-model, which are documented by making drawings, photographs or digital 3D models, as well as seeking references and writing a short analytical text on the basis of the thematic exercise.

The products of all eight FS tasks set in the first year (in F&V 1 and 2) are presented in an individual, graphic document, the Form Studies Year 1 Booklet, handed-in at the end of the third quarter.

The themes of the FS exercises:

- OV1.1 and 1.2: Space, Form and Massing: Dynamic Perspective;
- OV1.3 and 1.4: Form & Counter-form: Interior & Urban space'
- OV2.1 and 2.2: Structure and Connection: Construction & Detail;
- OV2.3 and 2.4: Dimension and System: Proportion & Collage.

Form Studies is further offered in elective courses: the third-year free-choice, international Minor House of the Future and MSc elective courses Form & Modelling Studies.

Drawing Studies

Drawing is one of the most elementary and evocative of design-skills which, despite the steady influx of computer-based visualisation-techniques continues to be recognised as an essential aspect in the BSc learning-cycle.

Traditionally, the emphasis in the (free-hand drawing) teaching programmes lay on representational drawing, generally involving the accurate visual documentation of a given set of elements or –surroundings.

However, it was questioned if this traditional approach would be fitting in the context of the new BSc curriculum, in the context of F&V1 and 2.

Some problems that needed to be addressed:

- the amount of time allotted for guided teaching-sessions would be very limited, coming down to a maximum of 4 to 5 hand-on teaching sessions in a drawing studio per module;
- the limited, basic drawing skills of the participating first-year students, many of whom proved to have hardly any recent drawing-experience;
- the desire to stimulate explorative- and analytical drawing on the level of design and research, rather than aiming at traditional standards of 'artistic' representation.

It took considerable time - and effort - to get the staff-members of the original free-hand drawing team to enthusiastically develop the envisioned, new drawing programme. Due to various reasons, the bulk of the teachers left the faculty at the end of the first F&V year. Their place was taken in by enthusiastic guest-lecturers, who have contributed considerably to the furthering of the new first-year Drawing Study course.

A meaningful difference is that 'designerly' modes of drawing have been given more prominence in the programme, meaning that the students are essentially set form-variation tasks, which stimulate their design-visualisation skills that can be then be put to good use in the following design-modules.

As a consequence, drawing-from-perception of specified objects or spaces now tends to take up the first half of the studio-lesson, after which, in the second half, the emphasis shifts towards more design-like, experimental drawing, which is continued and further developed in self-study.

The results of the individual explorations are reviewed in the next DS lesson, two weeks later. Per module, the results of the drawing-exercises are featured in the individual Portfolio.

The themes of the MS exercises:

- OV1.1 and 1.2: Object and Space: Rectangular & Triangular shapes;
- OV1.3 and 1.4: Interior and Context: Central & Aerial perspective views;
- OV2.1 and 2.2: Massing and Connection: Combined & Exploded views;
- OV2.3 and 2.4: Complexity and Presentation: Posters & Portfolios.

At present the Drawing Studies programme is only part of the first-year F&V programme, but initiatives are being developed towards further integration in the BSc design projects and possibly: more specialised elective applications.

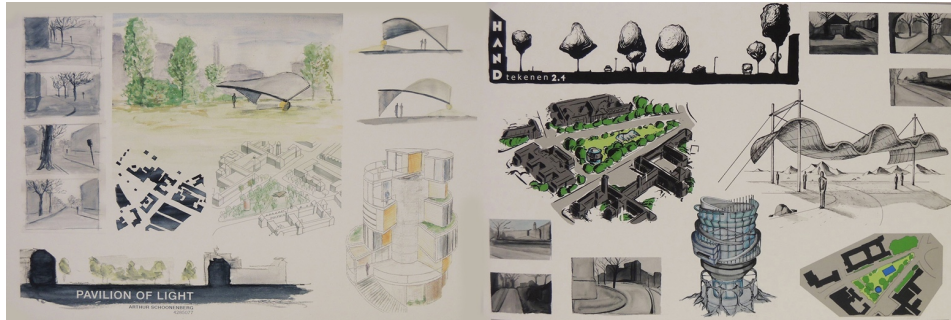


Fig. 02. Examples of presentation posters of the F&S2 Drawing Studies programme].

Source: Jack Breen

Model Studies

Design-based Modelling has always played an important role at the Delft faculty of Architecture and continues to do so, not only in the context of the F&S programme, but also on several other levels of the BSc and MSc curricula, down to the final MSc Thesis-projects.

As such, the aspect of physical, design-based modelling is introduced from the very beginning, as an integral part of the first-year's kick-off project – The Bridge – in week 1.

During the first weeks all new students to the faculty follow an introductory course on the level of modelling techniques, in which they are acquainted with the faculty's modelling-workshop facilities and the available computer-aided modelling applications (CAM-lab). After that, explorative, hands-on modelling plays a central role in the Form Studies programme, whereby the essential outcome of each set task is a – presentable – study model.

Apart from physical modelling, the F&V modules target the development of various digital modelling skills. In the first module, the new students become acquainted with easy-access 3D-modelling techniques, whereby 3D 'Sketch' modelling is made instrumental, as an extension of the Drawing Studies and – particularly – Form Studies exercises.

For all of the FS (and part of the DS) tasks in F&V1 and 2, the students are required to document their tangible, physical results using SketchUp (or similar)

applications. This allows them to fine-tune their spatial object and, by using different Layers and Views, create representative images on the basis of their work, which are then used in their F&S Portfolio's.

In Form & Visualisation 2, the approach to 3D modelling is distinctly different, whereby a third part of the course as a whole is reserved for the development of elementary Building Information Modelling (BIM) skills, with the faculty's Technical Design and Informatics group (TO&I).

The intention in this application is that students begin to develop 3D technical modelling skills, making use of integral, product-based digital techniques (in this case: working with Revit).

As these are their 'first steps', the idea is to keep the task relatively simple, but stimulating. After experimenting with a 'Water Loft' in the first two instalments of F&V2, the choice has been made to let them develop the last of a relatively familiar (typically Dutch) row of houses. Each student develops and models his-or-her own design proposal and at the end of the module hands in a set of technical- and presentational files.

To get the students to 'hit the ground running' when it comes to this sub-project, an integral workshop is organised during the first F&V2 day, whereby students are asked to develop a concept on the spot, by drawing and physically modelling a first concept, which they take with them to their first MS lesson.



Fig. 03. Two examples of F&V1 digital Portfolio files.

Source: Jack Breen].

Portfolios

Each of the two F&V modules begins with a kick-start project on day 1 and ends with a personal Portfolio, which is handed-in in week 10. The idea of these Portfolio's is that students also learn to develop graphic-design skills to present and communicate their study-results.

In F&V1 students are asked to make a compact, concise digital presentation of their work during the course of the module: a PowerPoint (or PDF) presentation of 10 slides:

- An introductory slide, with name, title and opening image;

- Eight slides corresponding with the exercises (4 for FS and 4 for DS);
- A closing slide, with a collage, quote or reflection on the module.

In F&V2 the set-up is different, whereby the individual students hand-in three different sub-portfolios:

- A graphically professional booklet of their first-year FS results;
- A physical folder of drawings and presentation-posters for DS;
- A digital folder of model-files and presentation renderings for MS.

The aspect of graphic visualisation is a central theme, whereby platforms like Illustrator and InDesign are brought under the students' attention.



Fig. 04. A selection of FS booklets handed in at the end of F&V2.

Source: Jack Breen

Results and Developments

By the time of EAEA conference, the new Form and Visualisation program will have completed its fourth educational cycle. Time for an evaluation of didactic methods, teaching content and educational results...

The first instalment of F&V1 in 2013 was both enervating and uplifting. The first start-workshop – The Bridge – was a success and the exercises went very well, leading to a good score for the module as a whole.

F&V2 as yet proved to be more difficult, whereby particularly the integration of the Informatics exercise was not yet optimal.

Throughout the first four years, meaningful changes have steadily been introduced, with subject matter, planning and methodology constantly being discussed, redeveloped, tested and fine-tuned on the basis of feed-back from students and staff.

Some of the most meaningful changes:

- In the second instalment, the start-week with the integral Bridge-project was repeated, but it became clear that this set-up led to problems in week 5, in

which students were required to do written exams for the other module. In instalment 3, the workshop was concentrated on one day, meaning that normal lessons could begin in week 1 and a lesson in week 5 could be skipped, leading to less deadline-stress for the students.

- Similarly, the number of lectures was gradually brought back, with an integral start-lecture at the beginning of both F&V1 and 2 as well as half-way through F&V1.
- Changes in staff were something to deal with from the first instalment onwards. Due to the departure of drawing teachers and a prominent Form Studies tutor after the first year, new staff-members had to be brought in. On the whole the introduction of new (guest) teachers worked well, speeding-up the renewal of the drawing exercises and bringing new blood into the FS group. In each of the four instalments, a different Informatics staff-member was involved in the MS course.
- At the beginning of the fourth instalment of F&V2, apart from the usual graphic design introduction, a special InDesign instruction was given. All students were required to use the same basic format (21 x 22 cm) for their FS booklet design.
- At the beginning of the first instalment the number of new students was still quite oversee-able (initially some 240 first-year students). This was a good thing for the implementation of the newly developed (and –developing) programme. In the last instalments, student-numbers have increased to around 380, meaning a less-than-optimal situation for student-tutor interaction.

Conclusions and Perspectives

After four years of developing, fine-tuning, re-arranging and performing, the new BSc programme as a whole seems on the to be working well. A negative point is its rigorous structure, which allows as good as no flexibility for students or staff-members. A positive aspect is that the BSc curriculum has become more of a whole, educationally and that there is far more interaction between teaching-colleagues from different disciplines.

Within the whole BSc conglomerate, the two first-year Form & Visualisation modules have developed into an intricate educational framework that has managed to gain – and maintain – a meaningful position, with relatively little need for major changes.

Furthering this education, possibly in the context of a next serious overhaul of the BSc curriculum, will be in the hands of a next generation of motivated education-pioneers on the level of Form-, Drawing- and Modelling Studies!