RE-APPROACHING TEACHING PROCESSES WITHIN DESIGN-BASED DRAWING USING IMPROVISED GAME-PROCESSES

Robin Schaeverbeke\textsuperscript{a}

\textsuperscript{a} Sint-Lucas School of Architecture, Brussels, Belgium
INTRODUCTION

This article introduces the curricular ambitions and the involvement of the “Extended Drawing” research project by expanding upon some of the guiding principles which are shaping the project’s educational exercises.\(^1\) “Extended Drawing” as a research project researches the influence of designerly media upon the designed artifacts they generate. The project searches for a re-evaluation of, what we like to call, design-based drawing processes through inquiring the expansion of the traditional notion of designerly drawing within (preliminary) design processes.\(^2\) The project’s central research question concerns whether and how the changing and combining of different media and representational systems is able to change designerly conceptions and, subsequently the thinking, within design-based graphical processes. One of the project’s key ambitions is to gain a more articulate understanding of these changes in order to re-approach learning processes within (design-based) drawing and media-courses. The exercises, referred to as games, serve a double function within the research project: both as a tool to teach designerly media and as a tool to research explorative media. Within education the games are used to offer a mediated design-based process structuring the different techniques and tools attached to our media curriculum. Within research they offer condensed structures or processes to develop improvised spatial compositions in order to investigate the functioning and generative value of explorative media. Within the courses it is our aim to trigger, through active explorations and creative combinations of certain tools and techniques, a heightened awareness amongst our students for their generative possibilities within design and thinking processes. The two exercises which are subject of this article are to be situated within the first year of a program in architectural education, more specifically within the media-classes dedicated to visualising and representing design.

DIGITALISING DESIGN-DRIVEN DRAWING—A BRIEF HISTORY

Only a couple of decades ago computers were hailed into our architectural practices and subsequently schools as a new feat enabling designers to move away from the laborious drawing process which up until then characterised designerly production. Computers made it possible to work and rework drawings without the hassle of having to redraw everything as things changed. As such within design-based environments computers not only

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\(^1\) The exercises were developed by the author and implemented together with Kristien Van Merhaeghe figuring as a critical colleague in teaching the games from an analogous point of view and Bart Mermans and Willem Vandeputte translating the exercises towards CAD and 3D-modelling sessions.

\(^2\) Throughout the article we will make a distinction between design-based and designerly. Design-based is to used to characterise activities which cannot exist outside of (a) design processes, an activity which is driven by design, in our case the drawing is specifically driven by design-based questions. Design-based should be regarded as activities and questions which are rooted within design, architectural and spatial thinking. Designerly will be used to denote concepts, activities and questions which are related to design and “giving form” in its broadest sense.
facilitated designerly production processes but also changed the way we communicate through images and made image editing and graphical design accessible for everyone. Computers brought sheer unlimited calculation speed and storage room and by doing so opened up new areas of design and design thinking. Computers have, since, enabled designers to design, visualise, calculate and, more importantly materialise complex geometries, shapes and/or processes. As the hard- and software matured, evolved and proliferated computers gradually established a firm place within our practices as an indispensable tool to and for design. But while computers happily kept getting better in performing a wide variety of actions, views upon and approaches to creative design-based drawing, especially within the realm of education, had a hard time keeping pace and adapting to this new digital reality. While no one seems to question the computer’s supremacy within (designerly) production there is a growing concern as to the seeming decline of the practice of “manual” drawing and sketching as tools to and for design. While most sources seem to agree upon the unparalleled power of (freehand) drawing within design we are left quite clueless trying to confront a generation of digital natives, young people for whom working digits seems easier than painstakingly practising and exploring ways to express themselves on a sheet of paper by hand. In order to teach this new generation the possibilities of freehand drawing we took it is our responsibility to revaluate its position within design.

Exchanging drawing boards for computer screens got rid of an age old omnipresence of freehand drawing as a working and production tool throughout design and learning processes. Redefining our freehand drawing courses amidst the ongoing digital (r)evolutions has been a topic for debate within our teaching team for quite a few years now. While everyone involved seemed to be convinced of the fact things needed to change to safeguard the craft from evaporation and acknowledged the growing discrepancy regarding the curricular approach of both, analogue and digital, modes of representation, a gradually widening gap between the different points of view resulted in a stagnation where both modes remained fundamentally oblivious to each other’s inherent qualities. Eventually the collective apathy to inquire or implement alternative possibilities to teach designerly media resulted in defining our research project. If only to provide us with research-based material to inquire possible changes. More and more we started to see that maintaining the strict schism between analogue and digital realms was leading towards an erosion of some of the basic drawing-related concepts and skills within our teaching

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approach. The fragmented teaching and assimilation of some of the overarching design-drawing principles proved to become troublesome to our students – both inside and outside of our teaching team. Meanwhile both personal involvement in practice and practice-based research reveals that combining both modes is able to amplify the thinking involved, to the extent that one mode is able to trigger possibilities within the other and vice versa. Participations within both bachelor and master juries revealed a growing deprivation as to graphical vocabulary and an impoverished use of the generative powers of certain media altogether. It was clear that a new approach would have to search for ways to respond to this detrimental situation by looking for innovative ways to teach and collaborate in order to expand, stretch and extend our own and our students’ possibilities to visualise design.

DESIGNING A NEW (LEARNING) APPROACH

In 2011 a structural reorganisation within the overall teaching program opened up the opportunity to return to some of the discussions in order to re-approach our teaching team’s curriculum. The department was planning a new learning structure and we were asked to propose an alternative curricular approach for the media-related courses. These courses would be reassigned to the first two semesters of the architectural program where we would be able to spend more time with our students to teach and explore designerly media. Next to the extended timeframe we were somewhat inclined to start thinking about strategies to blur the boundaries between analogue and digital media through exploring durable ways of collaboration between these modes of representation. All this implied that within a few months we had to come up with an entirely new curricular approach! In order to define what designerly media stood for – both in practice and in teaching, we plotted a list of terms, tools and techniques which could guide us within the conceptualising of the new program. We defined designerly media as ‘an unlimited pool of possible tools and techniques allowing designers to explore and communicate design and design thinking’.

5 think of projective drawing, parallel perspectives, vantage point and perspective construction, basic modelling, shadows, lighting, composition, scale, paper-space and lay out, line thicknesses,...

6 We can refer to Vinod Goel within his “Sketches of Thought” were the author gives an account of an experiment where students were invited to design something using solely computers or freehand drawing. In both cases the students indicated that isolating media within a design process worked counter-productive. The freehand version indicated that at a certain point there was a need to start inquiring things on a computer while the computer version indicated a lack of explorative possibilities caused by the medium. See: Vinod Goel: Sketches of thought [1995 MIT-press], Willemien Visser argues that within design several intuitive are used to represent an opportunistic flow of ideas; Visser W. “the cognitive artifacts of Designing”, Eds Lawrence Erlbaum, 2006, in a recent paper by Catherine Catherine Olsen argues, in a recent paper, that ‘In practice, designers exploit both tools (i.e. sketching and CAD) as they need them, and are less concerned with whether it is the “right” phase in the design process to use them. Olsen C., Sketch Based Interfaces for Modelling and User’s needs, redefining connections’ submitted paper, Case Studies in Architecture and Product Design.

7 see Appendix: designerly media

8 All teachers involved within the teaching team are or have been involved in architectural practice.
Designerly media aren’t used in a vacuum or merely exploited for their pictorial qualities. Within design there is a strong bond between the thinking and the need to externalise that thought through drawings and models. We saw it as our task to explore the designerly qualities of the tools we intended to introduce. In other words we were in need of a design-based structure able to ground our renewed curricular development.

While inserting design within our media classes may seem like an obvious thing to do in a design school, the working practice of teaching the craft of drawing makes it a difficult aspect. Working on design tends to hamper our courses rather than helping them. Because bringing design to the drawing classes runs the risk of distracting us from “drawing stuff” to aspects within and behind the practice of design and architecture. That said, excluding designerly aspects from our courses runs the risk of reducing drawing to a mechanical act of making lines and marks on a carrier. Learning how to draw, in essence, is a matter of modifying one’s perception. It’s a learning process through practising techniques to graphically visualise what one sees or envisions. Within design education confines focussing too heavy on perception tends to ignore the creative thinking which ultimately drives the design-based drawing. On the other hand focussing too heavy on design diverts attention from drawing to quality related aspects of form, space and functionality which tend to frustrate the development of drawing skills versus a certain appreciation concerning content of the designed artifact. Finding a balance is a major concern, not even mentioning avoiding competition with neighbouring assignments within design and form studios. Reflecting upon these issues brought us on the trail of inquiring mediated processes where the designed artifact could be produced by the process rather than the creative thinking involved.

Looking for a conceptual precedent we stumbled upon the field of open compositions or game-driven improvisation. 9 Within improvised music – especially within its most extreme family member, free improvisation, one develops compositions and experiences through a combined process of playing and listening while performing. 10 Since the practice agrees to dismiss of scores and preconceived schemes to refer to, it is up to the musicians involved to invent and design musical ideas as the structure and performance evolves and develops itself. This creates a hyper-awareness for what happens and already happened within the music and performance. While improvising artists are still involved within music making,

9 Exploring games as a guiding structure has been investigated within the practice of improvised by several composers such as John Cage, Christian Wolff, Cornelius Cardew, John Zorn, ... For an extended description of the concept of game pieces see: “The Game Pieces” in Christoph Cox/ Daniel Warner (editors): Audio Culture [2004, Continuum]

10 See Gary Peters for a philosophical introduction to the concept of improvisation; Gary Peters The Philosophy of Improvisation [2009, University of Chicago Press]. Also see John Zorn’s Arcana series, Derek Bailey and Edwin Prévost for a series of practice based essays upon performing and improvisation; Eddie Prevost: No Sound Is Innocent [1997, Small Press Distribution]; Derek Bailey: improvisation (It’s nature and practice within music) [1993, Da Capo Press]; John Zorn (editor): Arcana I (musicians on music) [2000, Hips Road/Granary Books], Arcana I II (musicians on music) [2007, Hips Road/Tzadik], Arcana III (musicians on music) [2008, Hips Road/Tzadik], Arcana VI (musicians on music) [2009, Hips Road/Tzadik]
the attitude and mindset is radically different than the one of their score and song-interpreting colleagues. Improvisers extend notions of technique and interpretation through adding personality and the ability to react meaningfully to sudden changes within the performance. Within our exercise we were looking for a similar mindset: developing a spatial composition through “playing”, i.e. by and through drawing and modelling. In order to avoid the pitfall of producing meaningless noise or unconsidered and senseless spaces, in our case, we started looking for some kind of framework to ground our new teaching approach. A framework that organises and guides the formal and spatial development of the exercises while at the same time ruling out any stylistic, compositional or formal discussions concerning the developing artifacts. Within improvisation related pedagogics or even as performance technique game-theory or open-form compositions are a considered as a tool to guide and/or limit personal taste and/or habits of the performing actors involved. In a certain way, within such improvised structures inventing music becomes a side effect of the interplay which is driven by composition’s arbitrary constraints. In essence these games divert the attention from “what to play” to “how to play it”, essentially what we were looking for within our own exercises – diverting attention from “what to draw” to “how to draw it”.

GAMES WITHIN DESIGN

Within design education and participatory design contexts gamesque approaches are typically adapted as a tool to introduce novices or non-design actors within the field of design. The game element helps to initiate newcomers to certain peculiarities which are characteristic to design, to get acquainted within the language of design or as a tool to break down barriers between the novices and experts. Habraken and his colleagues, for instance, developed ‘Concept Design Games’ which aim to understand, conceptualise and improve the collaborative development of buildings and environments. The idea behind Habraken’s games is that they enable stakeholders and parties involved to ameliorate the design and thinking processes necessary to develop a building by using the community’s potential and, vice versa, by enabling the designers to canalise the different views and interpretations of the parties involved. Another example comes from Bucciarelli who introduced design thinking to engineering students by using a kind of an identity game. Within Bucciarelli’s approach students receive a specific role (architect, project manager,

11 Classic examples focus on basic compositional structure such as A-B-A or A-B-A-C-B where every letter stands for a new movement regardless of its musical concept. Another example is more action related where to play and not play and following and going against as a musical idea is structured as set of rules. The idea behind these and more complex rule based improvisations is to limit, to some extent, performance possibilities and creating an awareness for recognizable movements within the performance both for the players and the listeners.

structural engineer, thermal engineer) to design a residence for the inhabitants of an imaginary world. Bacciarelli’s games try to replicate different responsibilities which are characteristic for the design practice and its relationships. A similar structure is found in Mari & Gallerani’s chart game “Mixing Identities” which was revisited in a 2006 Domus article. This game appoints the students with an identity, a dwelling typology, a background, a relationship, a neighbourhood and so forth in order to take in the complexity of everyday life. Here the participants have to design a possible residence for the game’s proposed characters and building sites. John Hejduk’s “Nine Square Problem” (1954) remains the closest link to provide a body of knowledge to what we are developing. Hejduk’s “Nine Square Problem” consists of a linear grid of nine squares which is the base to create an architectural space by using concepts such as frame, post, centre, periphery, extension and compression. Hejduk’s “Nine Square Problem” was introduced as a pedagogical tool for first-year students within the realm of interior architecture and over the years the structure has been used and appropriated as a teaching tool within undergraduate (architectural) teaching programs.

The examples cited above search for more or less the same goals: translate design-based concepts into a gamesque process in order to introduce or enhance novice’s understanding within design and architecture. Within participatory design games can help to improve understanding between designers and non-designers throughout the development of a building or neighbourhood. The games offer the different parties involved a guiding framework in order to negotiate by interacting with each other. Hejduk’s “Nine Square Problem” specifically aims at novice students and searches to introduce an architectural language by manipulating form, space and their structural concepts. Games and variations upon Hejduk’s scheme help to playfully introduce some of the overarching architectural concepts by making an abstraction of the elements which make up the architectural language. Still there is a difference compared to our ambitions. Our games are designed as a tool to learn the students how to draw and communicate form and

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14 see Librizzi F., Pirovano C.: “Mixing Identities, a card game for making the most of the unexpected in everyday life” in Domus 895, september 2006 edited by Picchi F. and Porcaro S.


16 see amongst others: Natalia Subotincic: “Inside Out” proceedings of the 21st National Conference on the Beginning Design Student San Antonio 2005 pp 316-323,

space. As such they seek to rule out active designing by investigating ways to develop architectural structures without overtly being constrained by the underlying architectural content.

DEVELOPING DESIGN DRAWING GAMES

We are working on two different game processes, one for each semester. The backbone of both exercises is defined by a process-based, sequential structure where students carve and/or fold their way through space. Both processes draw from the learning processes characteristic for design-based drawing courses. The pedagogic approach to teach and learn (basic) perspective and spatial drawing relies on the geometrics of cuboid perspective. By applying this approach the students practice and develop the ability to draw cubes from various points of view and in varying perspective frameworks. The cubes act as a basic geometric scale element. The learning curve gradually progresses towards more complex shapes by multiplying, subtracting and deforming them. Combining the idea of drawing cubes with the notion of creating space led to development two drawing games which start from 30 tangible cubes. The idea is that through shifting the cubes the students playfully explore spaces while getting acquainted within the language of visualisation and representation. Through integrating and layering different architectural drawing and modelling tools the gamesque-processes search for a self-evidence pushing the students to switch and explore different media and modes of representation to create and discover forms and spaces. Within the exercises we encourage our students to unearth and embody personal paths to explore and visualise design. The gamesque processes search for ways to divert attention from design to drawing, approaching drawing in all its variety as a tool for designerly exploration and communication. We would like to refer to the illustrations for a general idea of the exercises and their processes because expanding upon the specific parameters guiding both exercises would set us adrift from the core of this article.

18 The list of publications which consider design-based drawing seems to grow every day... All have in common that they start from a basic cube to illustrate the specifics of projective drawing, perspective drawing, shadow theories, ... see (amongst others) Francis D.K. Ching: Design Drawing [1943-1998, Van Nostrand Reinhold]; Koos Eijssen/Roselien Steur: Sketching [2007, BIS]; Rod Henmi/Iain Fraser: Envisioning Architecture (An Analyses of Drawing) [1994 John Wiley and Sons]

19 i.e. parallel perspective, one-point perspective, two-point perspective, three-point perspective

20 i.e. projective drawing, perspective drawing, digital drawing, sketching, graphics, modelling, image manipulation
[IMAGE A] TWO VIEWS ON EXERCISE 14MM: DEVELOPING THE SPATIAL COMPOSITION THROUGH PHYSICAL DRAWING (DRAWING BY THE AUTHOR) AND DEVELOPING THE SPATIAL COMPOSITION THROUGH DIGITAL MODELLING (DRAWING BY WILLEM VANDEPUTTE)

[IMAGE B] 24MM'S MODELLING PROCESS (DRAWINGS BY LISA ESTIEVENART)

[IMAGE C] 24MM'S LANDSCAPE: WITHIN A BOUNDING PYRAMID THE STUDENTS DEVELOP A MOUNTAINSCAPE DIGITALLY AND REFINE THROUGH MODEL MAKING, SITING THEIR STRUCTURE AND DEVISING AN ARCHITECTURAL APPROACH (DRAWINGS BY TIMOTHY VAN LAETHEM)
TESTING THE GAMES, A REVIEW

Last year we ran a first test of both exercises. The exercises we refer to as games search to engage the students in an experience in such a way that it becomes easier for them to develop knowledge and skill within drawing and spatial representation. The game element aims to insert concepts and notions of design within the media curriculum and offers a mediated structure to facilitate collaboration between the analogue and digital components. As a teaching tool the games aim to divert attention from specific tasks by introducing a process where one has to adhere to certain (open) rules by using tools. The rules offer a comprehensive structure to step by step introduce the students within drawing techniques and design media. The aim of adhering to the rules of the games is to induce the students to make and explore different kinds of drawings and drawing techniques. We ran 14mm, the first exercise, in five groups of students with three different teachers. 24mm, the second exercise, was run with four groups and three different teachers. Only one of the teachers was involved in designing the game. The following will critically review several aspects of the exercises/games in order to identify certain anomalies or inconsistencies within the two processes. The reflections are based on personal experience and incorporate several critiques uttered by colleagues and peers combined with informal talks with some of the students. We will review the games and their processes as to their ‘designerly aspects’; as a framework to introduce designerly drawing techniques’ and as a ‘mediated structure to facilitate collaboration’ to end with some preliminary conclusions regarding the experience.

Designercly Aspects:

It was our intention that the games would peripherally introduce notions and facets of design and design thinking. Within 14mm’s initial modelling phase a circulation route through a solid grid of 30 cubes is developed. [see image A and image 1] Retrieving and repositioning cubes creates a passage way through the solid model and by doing so the cubes are reshaped into a new formal configuration. From a teaching point of view the assessment of the forms was quite straightforward since the circulation route works or... runs dead. From a student’s point of view the shifting of the blocks introduces basic aspects of moving horizontally and vertically through a solid structure and the shifting reshapes configuration as consequence of the created circulation route. Within a second phase the students reworked this solid structure through digital 3D modelling. The digital CAD-model consists of three parts: the created circulation route and its voids and two extruded ‘strings’ of walls and floors. One string follows the long section, the other one follows the short section of the model. When the two strings are combined, the solid counter-form of the circulation route is subtracted from this combined structure to reveal a

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21 Exercise 14mm, in a first version, ran from October to December 2010 and again, in a revised version, from October to December 2011. 24mm ran from February to June 2012 with a revised version ready to be implemented.
similar form as the solid starting figure but now made up out of floors, walls, stairs and voids. Because this structure resembles an abstracted architectural form we are now able to insert notions of scale by introducing the human figure. 24mm follows a similar process but using two different levels. The first level develops a spatial composition along a process of folding a grid of cubes towards a spatial composition. [see image B, image 8 and image 9] Simultaneously the students develop a digital landscape modelled along a set of parameters within a bounding box. [see image C and image 12] Both the model and the landscape are interchanged between the analogue and the digital classes in order for them to merge into a contextualised whole.

From a modelling and consequently design-based point of view both processes seem to do their work. We had devised a modelling process which everybody would be able to execute because the forms are produced by the process of shifting and/ or folding cubes. Considering the final results we are not able to detect extreme preferences within the outcomes of the spatial compositions so that it seems that everybody was able to produce a reasonable structure. Admittedly some of the structures reveal a deeper complexity as to their spatial composition but based upon the final models we are not inclined to categorise the results based on spatial quality. Both exercises have generated a wide variety of spatial compositions regulated by the rules and process of the game rather than a directed design activity. That being said we have to point out that on a pedagogic level 24mm performed quite poor on the level processing space by using constraints. We conceived 24mm’s process as a more open framework than 14mm. Within 24mm we invited students to actively design their spaces, movements and environments. While its first phase (the folding of the cubes and the processing of the landscape) succeeded in generating a variety of compositions adding functionality and movement presented itself as a stumbling block. As a result we have spent a reasonable amount of time assessing functionality which was is contradictory to our idea of introducing a gamesque approach to focus on designerly media.

Another point of attention is the idea of inserting materiality as a generator of space and to re-shape the solid model [see image 10 and 11]. The final results revealed that the student’s material applications gave an impression of adding decorum rather than organising space and atmospheres. 24mm as a gamesque-process is in need of a similar set of ingenuous rules as we developed within 14mm. Rules which are able to provide the students with some undeniably clear parameters to generate a model without being distracted by thinking about the elements making up the forms and spaces. While both exercises produced a qualitative variety of spatial compositions another point of critique is the orthogonal gridded sublayer which characterises the outcome of both processes generating dominantly orthogonal compositions. Within 24mm we are currently experimenting with some constraints by introducing parameters of deformation to move away from the cuboid geometry and in order to extend some of the spatial possibilities and drawing techniques within the exercises.
Framework to Introduce Designerly Drawing Techniques:

The goal of the modelling process is creating a series of drawings of one’s particular structure. 14mm introduces basic drawing techniques which enable the students to visualise an uncomplicated architectural structure. 24mm expands upon the notions introduced in 14mm through exploring combinatory techniques; adding complexity through materialisation and contextual references. By the end of 14mm the students were able to visualise their spatial compositions using projection, (parallel) perspective and vantage point perspective. Moreover the use of tangible models helped to explain certain drawing techniques through using the models as a visual reference. Compared to the traditional approach of introducing a drawing technique regardless of its use and value within design or creative process 14mm seems to have provided some basic building blocks to communicate an architectural and spatial construct. A recent meeting to discuss our renewed approach with some of our colleagues teaching within design studios revealed that the exercises have heightened the students’ possibilities to communicate their studio assignments. The studio round-up of the first semester revealed that the students have appropriated our subject material in order to communicate their design-studio assignments. According to one colleague this has lead to a better overall quality compared to the preceding years. This could mean that 14mm is fit for its task as an introductory exercise because it is able to assist the students to communicate design conceptions outside of our courses.

24mm’s premise differs from 14mm in that the structure the students develop is used to study the combination of drawing, modelling and presentation techniques. Before we used the games we used completed design-studio assignments and even exemplary buildings from known architects to teach an array of modelling and editing techniques. This approach typically starts with redrawing and reworking existing structures which detaches presentation from the creative flow of being entangled in a design process. Using a gamesque approach introduces the creative development of a structure onto which a variety of techniques can be affixed. After the basic model was made we introduced publication software (Adobe® Indesign) as a digital archive or even sketchbook. The students used the software to illustrate their overall design processes and as a tool to design a final poster presentation. By introducing publishing and subsequently editing software quite early in the process the students were able to work on a presentation for a longer period of time. Up until recently we were inclined to teach publishing as a last step in a design process which inevitably leaves little time to fully elaborate on graphical design. Using the phases of the game’s process as ingredients and stretching time to finalise the publications has improved quality of teaching substantially. Not only because the graphical designs had time to mature but also because we could focus more upon concepts of communicating design. Next to publishing 24mm also introduced the students within image editing software to study and explore materials, materiality, context and human scale. Vector editing was used to enhance and harmonise the CAD plans. These techniques
were paralleled with analogue techniques such as painting, rendering, collage, printing and several other techniques. The digital as well as the analogue techniques were introduced as complementary tools and the exercise explored and promoted mixed as well as unusual combinations of media.

It seems that working on a personal artifact persuades the students to develop more personal images and drawings. Combining digital and analogue tools to present and communicate one and the same product also seems to underscore the specificities of the individual tools while being able to compare them with complementary and alternative ones. This aspect, especially within 24mm, highlight certain preferences amongst some of the students which enable us to push some of them in certain directions concerning tools and techniques. Compared to the fragmented teaching of tools and techniques (which is the way we used to do it) we see a more integrated and embodied approach concerning the apprehension and adaptation of tools and techniques. On the downside we discovered that 24mm tends to be too packed with technical introductions, both digital and physical. 14mm, as an introductory exercise, remains quite basic in regard to the different techniques. 24mm explicitly intended to expand the 14mm’s possibilities but now suffers from a heavy load of both analogue and especially digital techniques (advanced CAD, 3D-modelling, Image Editing, Publishing, Vector Editing). On top of that the exercise also searches for combinatory processes in order to reveal possible qualities of the “in-between”, that is what happens on the border of two or more techniques. This overflow of technical introductions seemed to hamper the creative assimilation of the introduced techniques. As a consequence the students merely treated and translated their forms within different programs by using different techniques. This contradicts our intentions to explore the creative and generative qualities of the different techniques in order to use them as a tool to –and for designing. One of the solutions to this anomaly was introducing basic digital modelling within 14mm’s process.

Reviewing the final drawings indicated that some students were able to produce more qualitative representations than others. This could point at several explanations or interpretations outside of our renewed approach: (i) the students with a ‘better’ ability to draw have understood the theoretical and practical implementations of the introductions more than the others; (ii) they have worked harder to excel in technical ability to draw and visualise or (iii) perhaps some of them have a better understanding of the internal logic of their spatial composition and are able to induce complexity within their spatial compositions and most probably a combination of these factors. Comparing the results with our experiences from before the games we have the impression that the overall quality of the drawing abilities of our students has improved. Which leads to another impression namely that the development of a personal spatial composition generates an affective relationship with one’s artifact which leads to a heightened involvement to assimilate and implement the content material. The same goes for the teachers involved: the individuality of the compositions brings about a more creative atmosphere as opposed to the isolated
teaching of drawing techniques. Bending the game’s constraints allows to raise the level of difficulty within the exercise to serve some of the students with a certain experience or ability within drawing. Overall our gamesque approach seemed to induce the development of different levels of drawing abilities but still, a lot of these assertions are in need of further research.

**Mediated Structure to Facilitate Collaboration:**

Concerning collaboration amongst members of the teaching team there still is a long way to go. There are several reasons for this. For one there is the difference of the shared content material (computers versus pencils), accents (resolution versus expression) and points of interest (virtual versus physical) all of which have to be negotiated and agreed upon in order to develop a more or less harmonious program. For instance practising digital drawing techniques relies upon memorising a set of parameters or codes which enable the intermediary interface to perform the action one intends it to perform whereas practising analogue drawing techniques is to some extent based on the physical repetition to train and embody certain bodily movements in order to define a certain expressive signature. While our approach intends to reconsider this duality some of the physical and mental differences in teaching combined with the spatial segregation as to the teaching environments demands extra efforts and energy to define and implement durable and working frameworks for collaboration. That being said the output of the exercises triggered a willingness to listen and learn in order to expand possibilities through collaborative approaches.

Within 14mm we are experimenting with exchanges of certain phases throughout the exercise. The process commences with the analogue unit developing a solid spatial composition (image A and image 2) which is to be translated in a set of digital CAD drawings. After a few weeks this solid model is reworked in a digital modelling session to create a “folded model” (image B and image 3). In a first run we developed this phase in an analogue workshop and this year the digital unit has translated and directed this crucial phase. The decision to do so relieved the analogue teachers from a difficult workshop wherein the students developed this folded model through drawing. Still, even within CAD, the phase reveals to be spatially complex to imagine. Within this run of the exercise the students have struggled with the impact of their intervention, not really grasping what they were doing. The final review of the processed material revealed that a large number of students lost a great deal of spatial qualities throughout the digitalisation process compared to the initial model. While the folded model should have contained the formal

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22 The physical actions within digital drawing (CAD as well as editing packages) consist of memorising certain keyboard shortcuts and specific tracking movements but, while the shortcuts speed up the drawing, they are more related to mental activities akin to learning how to type on a keyboard while learning how to draw is more akin to learning how to write with a pen, see Cavallin H., Martin W. M., Heylighen A.: How relative absolute can be: SUMI and the impact of the nature of the task in measuring perceived software usability in Artificial Intelligence and Society, Springer, 2007.
DNA of the solid model a lot of the digitally developed models differed beyond reason from their starting models. Compared to last year’s process where the modelling phase was executed “by hand” the results of this year’s run showed a larger number of structures which did not satisfy the game’s basic constraints. It seems that the students uncritically accepted what the computer proposed as opposed to really studying the model and its blueprint. While these assertions could provide valuable insights regarding the processing abilities of computer driven or manually driven processes we still need to harmonise our teaching approaches in order to compare and assess the differences between the two approaches.


24mm succeeded somewhat better to induce collaboration. The exercise introduces a wide variety of techniques to enhance and combine both digital and analogue visualisation techniques. We managed to exchange certain modelling phases but in the end the exchanges did not influence the spatial quality of the models as a direct result of the translation from one mode to another. The modelled “mountainscape” could serve as an example here. The idea was that processing a digital landscape would introduce the
students into curvilinear modelling, the landscape introducing a contextual reference to house the spatial compositions. The idea of developing a landscape avoids the modelling of “blobby” spaces devoid of architectural content. Due to a lack of a clear collaborative agreement upon the topic we weren’t able to investigate aspects of landscaping related the spatial compositions. While studying the landscaping, the planting, the routing and the siting of the model could have been thankful material to share between the courses and to be explored both digitally and analogously. The phase succeeded on a basic level but left a lot of opportunities untouched which could enhance spatial awareness and contextual thinking both through designing and modelling. Our next run of the exercise intends to heighten these collaborative exchanges and develop both landscape and architecture on a more fundamental level.

But our first run and the results achieved removed a lot of scepticism amongst other colleagues and collaborators so that we now are able to address their expertise to further investigate more consistently mediated processes. That coupled with further practice-based experiments to study certain modelling phases to be directly generated by a specific technique should help to move towards steady and self-evident processes concerning tools and techniques. From there on we can start thinking about joined sessions and/or workshops where both realms work together in order to reveal the generative powers of combined approaches throughout both processes.

**CONCLUSIONS**

The games were developed as a tool both for research and to use within a learning environment in order to link media to conceptual design thinking. Both games use circulation, to some extent, as a form generating concept. Within 14mm literary and within 24mm on a peripheral level. Up until now 14mm proves to possess a steadier teaching structure than 24mm. But within both exercises students have worked towards highly individual creative spatial compositions following a set of rules rather than actively being entangled within the designerly aspects which forge them. In both cases the actual generative phases took no more than a half a day workshop by the end of which everybody could boast an individual abstracted architectural object.

Purely based upon drawing techniques and presentational skills we saw that the average level of skill of the students has gradually improved compared to similar exercises devoid of processes and games. Off course we are well aware that reviewing drawings and images renders these kind of statements and conclusions within a realm of subjectivity but teaching perspective drawing and designerly communication has an advantage of possessing at least some verifiable features: perspective construction, foreshortening, scale, legibility, to name a few. Based upon these parameters alone we saw an increase in the average quality of the work. Still, we are too early in the process of implementation to jump to conclusions and boast that our approach heightens spatial awareness and induces
media-related skills. Another aspect we have to be well aware of is that reviewing drawings and images can’t work without an account of the aesthetic experience which also influences our final judgements. In that way the process-based material could be able to influence assessment because increases in spatial composition directs the visualisations. As such an individual’s progress and development is more easily detected. If so, the exercises also facilitate comparison which is a step forward compared to the sometimes very subjective judgements reviewing a set of unrelated drawings sometimes conjure up.

Bringing design to drawing classes shifted our attention 180° degrees from perception to invention. It enabled us to focus more on the media and tools which shape design but at the same time we seem to have lost precious time to spend upon analysing and exploring the life-sized world out there. Apart from overcoming some of the above mentioned “growing pains” both games still have to search for digital and analogue perception-related components to generate form(s). While developing both games we have to be aware that even within design, drawing is more than invention and exploration. Drawing is partly driven by expanding knowledge through seeing and analysing the world out there.23 This can only be practised through a combined activity of drawing and looking intensively. 14mm had a specific module which studied human scale and user objects but the additional assignments were treated as an obligatory nuisance rather than the study they were supposed to be and within 24mm we had the opportunity to infuse materiality and context on a more directed base. Initiating the process-based exercises for the first time got us so caught up within the game’s development and processes we didn’t find or made time to look around us in order to study some of the things around us which actually shape design. Next to developing a graphical design-based language both exercises lend themselves perfectly to study natural forms, landscapes and objects making up (public) spaces if only as a way to enliven an awareness for contextual thinking.

Within the exercises we have searched for a designerly approach for the drawing courses in order to avoid approaching drawing as a technical craft or merely as a matter of “how to”. While developing the games we have to keep Bryan Lawson’s statement closely in mind: “Designers do not draw for the sake of the effect they create, they are not artists in that sense. They are making marks on paper, or in a computer, in order to think about what they represent”.24 Within the courses we are studying how to structure an array of tools to explore design, by designing and through appropriating media as generators of our creative processes. As such the exercises explore notions of form and space by means of modelling,

23 According to Bryan Lawson in “What Designers Know” internalising the world and referential designerly artifacts through drawing an analysing closely forms a big part of the formation and education of designers and architects. According to Lawson the thinking and designing processes of the craft is currently changing due to the gradual loss of the observational qualities and uses of freehand drawing.  Bryan Lawson: What Designers Know [2004, Elsevier Ltd.]

24 ibidem
graphics and drawings, both analogue and digital. In the end drawing within design and architecture is not about the individual drawings but about the route a set of drawings take to become (a) design.

Note: Images selected from the following students: Ellen Adons, Max Dedecker, Melissa Denis, Ilse De Kerk, Kristien Naetens, Rijntje Jacobs, Diede Ramaekers all images courtesy of Sint Lucas School of Architecture.

IMAGES:

The images along the article serve as visual material in order to illustrate some of the aspects of the games/exercises as described throughout the paper. All images were made by first year students attending our media-classes based upon their abilities to illustrate the exercises. All images were taken from the output of the analogue drawing courses since the digital documents weren’t available to the author during the writing of the article. All images courtesy of Sint-Lucas School of Architecture and the students involved.
IMAGE 01: [14MM] INTRODUCTORY EXERCISES, PHYSICAL MOVEMENTS: DRAWING LINES.

IMAGE 02: [14MM] A SELECTION OF DIFFERENT INTERPRETATIONS OF THE FIRST MOVEMENT WITHIN THE EXERCISE. THE ONLY THING WE ASKED WAS TO BRING 30 CUBES OF 3CM X 3CM. WE INVITED THE STUDENTS TO STACK TWO STOREYS ALLIGNING THE CUBES 3 X 5. THE FORMS WERE GENERATED THROUGH APPLYING A LIMITED SET OF RULES TO MAKE A PASSAGE THROUGH THE SOLID CUBES WHILE KEEPING ALL OF THE INITIAL 30 CUBES.

IMAGE 03: [14MM] TWO EXAMPLES OF THE “GRAPHICAL INTRODUCTION”; TRANSLATING THE MODEL INTO A SET OF PLANS, AN ISOMETRIC PERSPECTIVE (INCLUDING SHADOWS) AND A FIRST ATTEMPT TO, INTUITIVELY, EXPLORE THE MODEL THROUGH PERSPECTIVE DRAWING.
IMAGE 04: [14MM] EXPLORING AND APPLYING VANTAGE POINT PERSPECTIVE THEORY APPLIED TO THE SOLID MODEL PROCESSED WITHIN THE FIRST SESSION.

IMAGE 06: [14MM] THUMBNAIL STUDIES OF THE INTERIOR SPACES OF THE “FOLDED MODEL”. THESE STUDIES SERVE AS A BASE TO STUDY DIFFERENT RENDERING TECHNIQUES

IMAGE 07: [14MM] EXPLORING ANALOGUE RENDERING TECHNIQUES
IMAGE 08/ IMAGE 09: [24MM] SPATIAL FOLDING PROCESS; AS A FIRST STEP THE STUDENTS START FROM A GRID OF 30 CUBES (5x6) WHICH ARE CUT IN THREE PARTS AND SPATIALLY FOLDED. THE FOLDING PROCESS HAS TO BE ILLUSTRATED IN ORDER TO EXPLICIT THE STEPS TO ARRIVE AT THE “SOLID MODEL”. THE DRAWINGS ARE THEN USED WITHIN PUBLISHING SOFTWARE IN ORDER TO REPRESENT THE PROCESS AS AN INSTRUCTION OR MANUAL.
IMAGE 12: [24MM] TRANSLATING A DIGITALLY MODELLED LANDSCAPE TOWARDS A TACTILE MODEL. THE "MOUNTAINSCAPE" SERVES AS A CONTEXT FOR THE SPATIAL COMPOSITION. SIMULTANEOUSLY THE SPATIAL MODEL IS TRANSLATED INTO A THREE DIMENSIONAL DIGITAL MODEL.
IMAGE 13: [24MM] VISUALISING AND EXPLORING THE INTERIOR SPACES THROUGH ONE POINT PERSPECTIVES.

IMAGE 14: [24MM] EXPLORING INTERIOR SPACES THROUGH SKETCHES.
IMAGE 15: [24MM] EXPLORING COMBINED RENDERING TECHNIQUES MAKING USE OF “ODD” MATERIALS AND COMBINATIONS.