

SCREEN AND PENCIL, AN INTERTWINED COMBINATION FOR TEACHING: FIRST REFLECTIONS ON THE IMPLEMENTATION OF AN ONLINE TEACHING TOOL WITH SPECIALISED VIDEO-TUTORIALS (SKETCH ATLAS) ON THE TOPIC OF FREEHAND ARCHITECTURAL DRAWING

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INTRODUCTION

Play, pause and replay

There is a compendium of extensive literature on approaches within the twentieth-first century educational system and the everlasting introduction of new systems. The combination of learning specific skills but also the unlearning of systems in the educational context can be found in the vision of Teresa J. Franklin.¹ Important components in the contemporary blended environment in Franklin's analysis are the mobile aspect and the need of direct connection through the cloud, MOOC's for everyone and virtual learning. In this regard, she argues that teachers constantly have to prepare students for unknown new environments in their learning trajectory and adept their system to it. The system for learning has to be flexible and with the new internet-mobility the classroom is open far behind the own university. A system of play, pause and replay is often a basic ingredient.

In the field of architecture and especially by the start in the first year for fresh students, there is an important skill to be learned. This skill is intrinsically connected with the profession: drawing and more specific the freehand architectural drawing. This type of drawing or sketch is basically made with a pencil on paper without any other device and learned in a studio environment, the "drawing room". How can this basic skill benefit from the omnipresent interconnectivity of the new learning systems? Is it possible to connect in a controlled way the online aspect with the tangible blackboard full of charcoal sketches and more important, the pedagogical system behind it? And more over, what can be the extra value of this implementation?

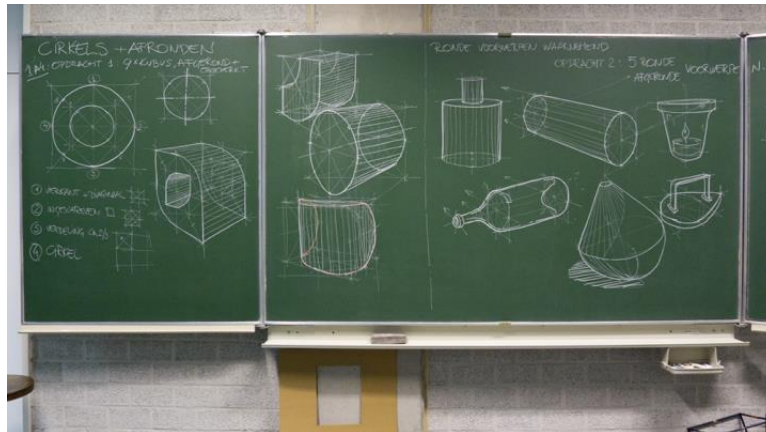


Figure 1. Blackboard with charcoal drawings, course with topic of curved forms, photo Iwert Bernakiewicz.



Figure 2. Classroom with blackboard, sketch course freehand architectural drawing, photo Iwert Bernakiewicz.

In 2018 we started with an innovative educational project (IOP) at the Faculty of Architecture and arts of Hasselt University. This project was enrolled under the name Sketchatlas (SA).²

The SA project aims to install the systematic digital registration by means of video recording of the zooming in on manual sketching skills, actions and processes within the course unit sketching of the study program (interior) architecture. The final goals were the immediate and delayed pedagogically active didactic unlocking (teacher tutorials via video clips in a blended learning process), the focused operational use of didactic feedback instrument and the durable preservation of the curriculum (archive).

The unlocking of these learning processes and educational content by means of video tutorials related to sketching takes place via a digital platform³. The SA, version 2.0, includes several unique features at this moment: eight and a half hours of tutorials in full high definition (4K) with a complete pedagogical trajectory and systematically structured. In the exhaustive study by Koenig and Schneider on the topic of online teaching the technical (dis)advantages of several open learning platforms are examined. They conclude that a customised website is the best starting point for a complete on-line video course.⁴

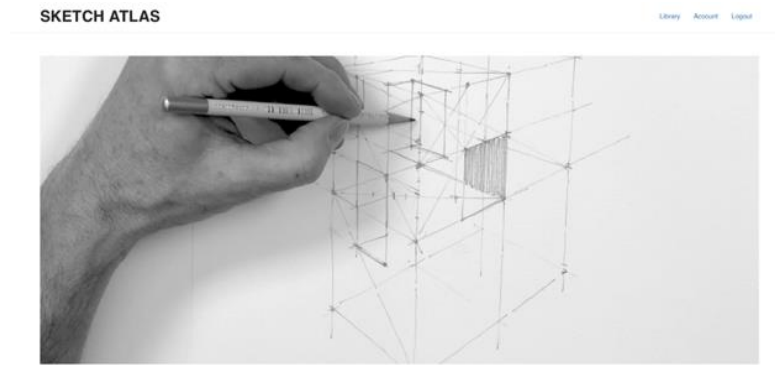


Figure 3. Still of tutorial, freehand architectural drawing of cubes, photo author.

Atlas

The term Atlas in our project deliberately refers to the structured compilation (from general to specific) of information and a general search function.⁵ The tradition of working with an Atlas and implementing the systematical order as a core concept is not new, we refer to the historical analysis of Ulrich Keller on this concept.⁶ A further step is that the concept of an atlas in the context of teaching becomes a handbook with a complete pedagogical structure. Hubert Lochner states that the narrative of a handbook is a key-element of the discourse in teaching through history.⁷

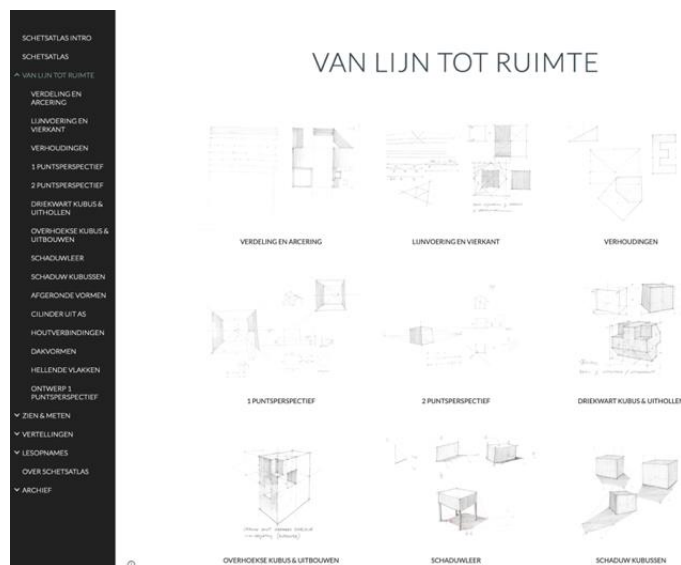


Figure 4. Still of matrix of SA version 1.0, chapters and thumbnails of tutorials, each figure is a tutorial, photo author.

historical roots

In addition to a live-demonstration, the use of step-by-step sketch examples is a proved didactic tool. Looking at example books with systematically worked out cases, in the tradition of the Beaux Arts architecture schools, is a tested method. However, a systematic sample book of drawing via elaborate sub-sections and descriptive information has become a pedagogically underexposed method in contemporary architectural education. This historical learning tradition in schools of architecture must be rapidly embedded in the contemporary context without losing the quality. The contemporary context necessarily includes a digital and international component.

Contemporary approach on sketch education

If we zoom in on the sketching method, what method of sketching is taught within the programs? On the one hand, the understanding of a piece of furniture, a space or an urban environment is done through sketching: the so-called observational sketching. Learning to draw methodically (building up step by step) from perspective and recording it on paper provides insightful information about size, proportion and rhythm. This **observational sketching** is a basic skill that is taught step by step.

In addition to this observational learning process, the training teaches how to construct a design while sketching.



Figure 5. Still of tutorial, observation sketch and the narrative of the sketchbook, photo author

Discussing and sharpening a design is done through the permanent production of design sketches: **sketching by design**. Both the observation through sketching and the final design through this same medium (alternating and sometimes overlapping) are forms of knowledge transfer. This specific transfer of knowledge has essentially two dimensions.

Sketching helps the designer to design and structures the internal thought process through intermediate steps. It is a method to analyze a complex problem and to formulate a personal answer through the design research. This is the internal dimension.

However there is also the external dimension: sketching serves as a mean of presentation or consultation during the guidance and the jury moments with the teacher in design education but certainly also in the professional world. For the (interior) architect, this presentation via sketches is an essential element of communication with himself, the office, the client and the executor.

Status Quaestionis

In the curriculum of Hasselt University, time is set aside to learn manual drawing skills. There is a long tradition of manual drawing and it still has its own place next to the more recent skills of computer drawing. In comparison to other architecture faculties, it is striking that a separate course is still set aside for the mastery of manual drawing skills. It can be argued that at other faculties, sketching often merges into a more broadly oriented course unit. In this case the mixing with other disciplines (computer drawing and presentation drawing) leads to an erosion: the previously explained strategy of perceiving and communicating, the important basic pedagogical component with respect to sketching, completely disappears. There is (too) much attention paid to mere representation, as a result of which the important methodological sub-aspects of construction, structure and perspective receives less systematic attention. It is precisely by being able to understand and represent objects and space in a structured way that spatial insight is developed and strengthened.

Internationally, one can see a twofold movement: holding on to a tradition or completely rethinking (and partly losing) the built-up tradition of sketching. We will further argue that in our opinion there is a well-founded argument to take the optimal path and implement pedagogical innovation through digital media (video) and combine it with traditional methodological tools - such as manual sketching. What are the important pillars in this teaching project of sketching? The answer to this question can be structured into a number of successive sub-components, namely: methodology and pedagogy of sketching. We will show that these points can be refreshed within the project.

methodology

The process of creating the sketch as a tool for registering and designing has, as explained earlier, simultaneously communicative and design-forming qualities. Interior designers and architects have developed a drawing language in which the research on and conception of qualities within a space are done through sketching, namely: the structure and construction of the project or object, perspective, colour and depth perception.

pedagogy

The transfer of knowledge of these aspects of architecture is done on the one hand by watching the act of drawing during the creative process and on the other hand by the mimesis and the execution itself. The teacher's demonstration in the sketching studio is a fundamental step in learning process.

The aspect of methodology has been documented many times in literature, we used the work by Frank Ching as a starting point.⁸ The correct construction of a perspective or the correct framing of an image are topics that are widely known.

The second component however, the pedagogical transfer of looking at the action of sketching is less systematically developed. Nevertheless demonstration is always mentioned as being very important. The act of sketching often has an aura of a forgotten craft, a skill to be learned or a unique talent.

This last association is due to the fact that in addition to a permanent transfer of knowledge, there is also a link with the artistic component in the training of (interior) architecture.

Drawing is a language that automatically contains various registers, from design search to constructive try-out. A personal signature forms a sharper part of the designer's identity. It should be clearly emphasized here that the mere cultivation of this personal signature was not a goal in itself within the SA project. As mentioned before, the main goal of the sketching course is to teach the basic skills of observational and design sketching.

As also stated earlier, throughout sketching there is a thinking process on the part of the designer: actions are performed one after the other on paper in a certain order. Lines and planes are placed next to and over each other and result in a final image with meaning. The action and handling of drawing therefore has a very volatile component: lines disappear and the end result does not (always) reveal the creative process. The pedagogical demonstration of sketching is therefore a continuous help in structuring a thought process. By showing the method in the tutorial the thought process is also formed. A good and relevant comparison is learning to read and write, where forms and conventions are also practiced in a similar way in an intensive learning process.

THE SKETCHATLAS IN THE CLASSROOM

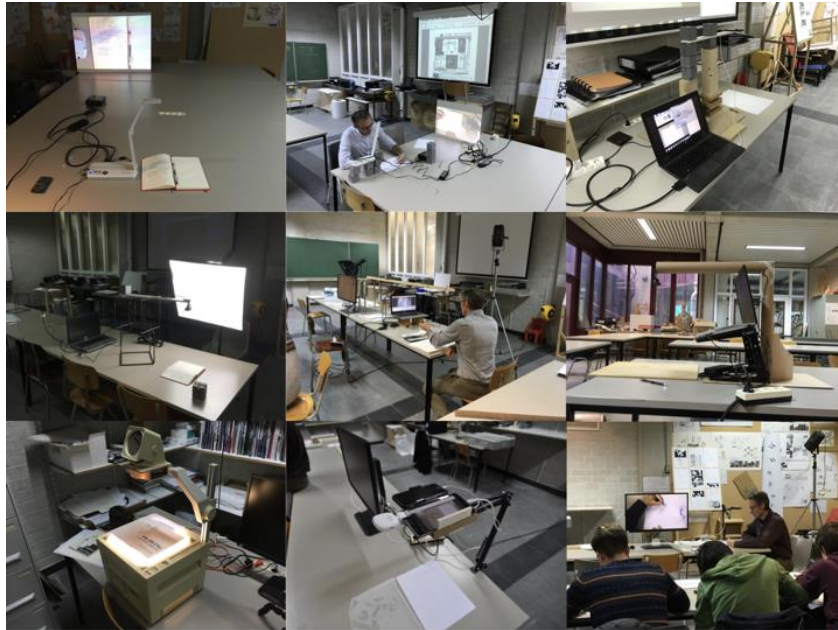


Figure 6. Testing of recording and projecting during sketch course, photos Aarnoud Derycker.

The pedagogy and methodology of the teaching process of freehand architectural drawing are intertwined. The following problem statements, to be read as challenges, were detected by the start of the SA project within the courses and are all linked to the pedagogy and methodology. These observations are also often not exclusively linked to one course unit or one program but are exemplary for learning processes where hand-on skills (universal term: "tacit knowledge") are passed on.

Too little time spent per student in demonstrating (1 on 1) sketching

Demonstrating and teaching sketching to each student or groups of students, however, often poses practical problems in architectural education. It is impossible to constantly make a sketch live for each student in a one-to-one class environment. The groups vary from 20 to 30 students per tutor with lecture periods of two hours each, which makes it virtually impossible to do a complete and thorough tutoring per student on all facets of the specific sketching exercise. Sketching on location (not in the sketching room but elsewhere) is impossible to organize in such a way that adjustments to the drawing can be picked up automatically by different students. With the SA the teacher can organize this process. The constant loop of a tutorial on the screen fulfills the act of repetition.

Impossibility of recalling specific (past) phases within the sketching process for Feedback

In addition, the action of sketching during the lesson moment or afterwards can never be recalled. In a learning process, repetition is always an important learning tool. When a drawing is set up in pencil and then finished off in ink, you inevitably lose the pencil phase. Sketching skills as previously argued must be learned systematically, repetition - also of mistakes and common mistakes - is very important in learning a skill. The videos of the SA can be frozen on every moment.

Absence of a quickly consultable archive of didactic teaching material (faculty level)

There was currently no well thought-out educational archive policy regarding the didactic teaching level. The process is not documented. Specific knowledge of the teachers that just cannot be compiled in papers or publications was lost. The SA is growing every year and more over with the search

function (version 2.0) it becomes also an archive. Good practice from outstanding students but also common mistakes of the average student, as mentioned before, can be archived efficiently through the SA into the education system in a structural way. The importance of "learning from mistakes is important in order to be able to start a future thorough self-study project freehand architectural drawing education.

Absence of a platform for knowledge exchange on hand sketching (on an inter-university and international level)

There was no workable tool for exchanging knowledge about the sketching process with other faculties of architecture in a national and international context. Exchange is thus forced to remain sporadic and coincidental in nature. However, an international context is important and indispensable for the proper accumulation of knowledge and, above all, the proper implementation of educational methods. In the 2.0 version the SA will be available for other schools of architecture.

What was the method and which actions were done in the timeframe of two years?

The first action for the SA project was: the recording of the tutorials, directing the recorded material and to classify the tutorials in a consultable matrix connected with the pedagogical system.

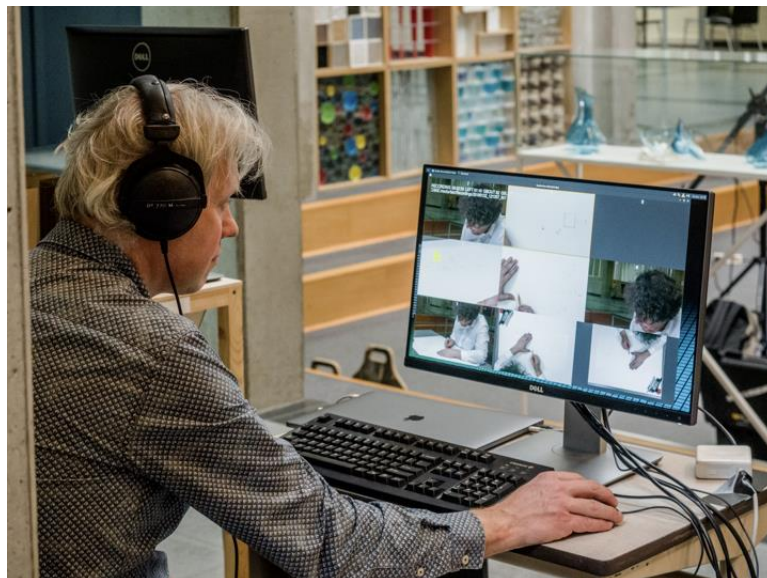


Figure 7. Recording day with multiple camera system bij EDM of sketch and hands of sketcher, photo Iwert Bernakiewicz.

Filtering and directing the material was strictly necessary. That is why in this project there was an important task for a “director”, to systematically collect the material and to introduce a first classification in order to build up a systematic atlas. The profile of this person was therefore someone with a technical and directional profile and with an affinity for the subject (graphics in general and especially sketching). This person acts as a "flying reporter". Prepared lesson situations and specifically set up test moments (zoom in of hands sketching teachers) are systematically arranged by him or her in the atlas according to the current course model.

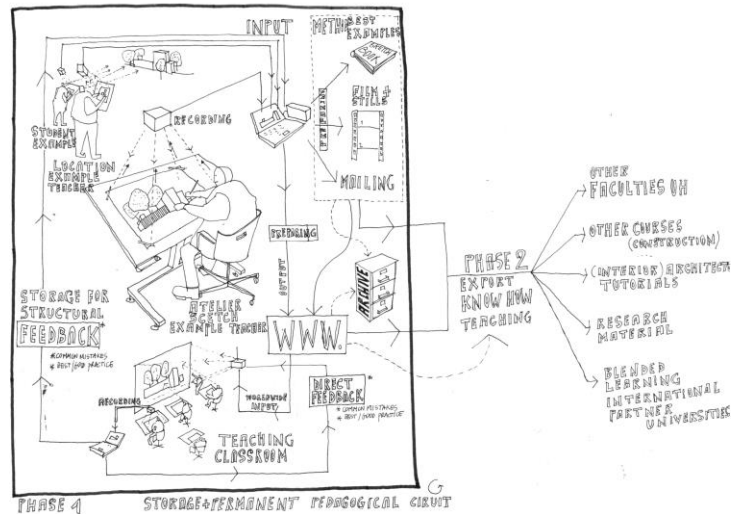


Figure 8. SA in the pedagogical system: classroom support, archive and learning from distance, sketch author.

As illustrated in Figure 8, the concept of the SA is a continuous loop. It includes both recording of sketching activities in the classroom environment and sketching by observation on the move. The sketch shows a multitude of possible (knowledge) circuits with moments that the video recording (of student and teacher work) can be actively used in the learning process. Feedback (literally rewinding the action) can happen on all those circuits. This is the big difference with the classical approach. The approach within the teaching environment will change. Groups of students can work with the basic material and also include their own drawing process in the lesson. In this way, a comparison can be made and general learning conclusions drawn. The best examples and a systematic overview of basic exercises (the idea of the atlas) can be called up at any time. Both in the learning environment at the university and in one's own home environment/study.

CONCLUSION

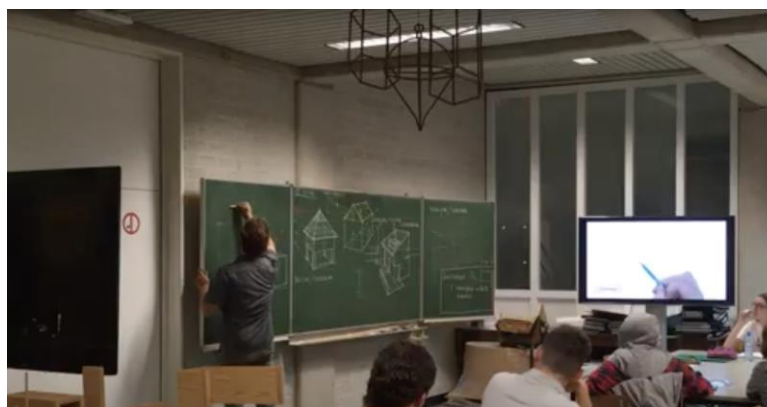


Figure 9. SA used in class: combination of blackboard and screen with loops of tutorials, photo Arnoud Derycker.

The project SA punctuates a pertinent false opposition in an architectural-educational context: the manual versus the digital. As already mentioned, the objective was to apply a digital technique very precisely in the architectural-educational process. The opening up of teaching material from sketch

courses has never been done systematically in this way. The creation of a link to students now and in future generations via a digital access (video, website) is a new way of transferring knowledge from the courses in a durable way.

The innovative aspect of the project lies in the combination of various goals namely improvement of the educational process, the archiving for educational development and the testing of a new platform. Goals are combined on the level of education, knowledge transfer and archive thinking. The project is a recalibration of an educational transfer.

Lockdown testing

A second conclusion is that even in a stress-situation, the 1.0 version was intensely used during the lockdown of March 2020, the system proved to be adequate. Before this special period parts of the SA were used in a blended form, the combination of the teacher and the screen with the constant play of the SA in the classroom as you can see in Figure 9. The drawing room became at that moment a blended teaching environment.

In the 1.0 version, used during the lockdown with a content at that moment of 8,5hours tutorials, the feedback module was not incorporated. However, by using other software and cloud functions (google drive, Miro) the students were able to communicate with the teachers. A special section of home-tutorials was installed on the platform during the lockdown. The complete off-campus scenario was a hand-on approach where important lessons were learned. The uploading of student work (home work and tasks) is a very time consuming and the need to comment with a (digital) stroke on the students work stays important. This is one of the reasons to headline the development of a feedback module in the 2.0 version. The proof is in the testing.

Without a proper framework – in this case the idea of an organization of content like an Atlas - the transfer of a specific pedagogical process during a lockdown (how to learn to sketch as an architect ?) would be very difficult. Fabrication of digital teaching material of high quality is a starting point but an overview on content and concept of order must be the first step. In an open discussion with students before the lockdown the SA was appreciated for its added value. An important remark was that it was never seen as a complete replacement. The real blended effect of the SA is the combination. The SA is not a replacement of the drawing room but a compaignon with added value and extra possibilities.

NOTES

¹ Teresa Franklin, “Embracing the Future: Empowering the 21st Century Educator,” *Procedia - Social and Behavioral Sciences* 176 (2015): 1089–96, accessed April 5, 2021, doi.org/10.1016/j.sbspro.2015.01.584.

² The project Sketchatlas (SA) at Hasselt University is not a project of one person but the continuous effort of a team. I want to thank my close colleagues for all their (ongoing) work on the project and the input for this paper: arch. Aarnoud Derycker (technical conceptualization/development SA + content specialist sketching), arch.lwert Bernakiewicz (co-author of basic idea SA + content specialist sketching), dr. arch. Lieve Weytjens (business developer at Hasselt University) and Bea Cleeren (transfer process to market ,innovation and spin-offs at Hasselt University in the Tech Transfer Office). We worked together for the recordings with Professor Philip Bekaert of EDM (centrum of expertise on digital media at Hasselt University). A trailer of the project you can find here: <https://www.youtube.com/watch?v=0p4xk-T7e0g>

³ The technical development of the platform (programming + back office) is not the subject of this paper. In the technical process of development the 2.0 version we choosed the wordpress platform with different plug-in options. More information on word-press you can find here: <https://wordpress.org>.

⁴ Reinhard Koenig & Sven Schneider. “Evaluation of systems for video-based online teaching: Create your own MOOC or SPOC,” proceedings *eCAADE37 /SIGraDi23 Challenges – Education and research – volume 1*, (2019): 110-116, accessed april 13, 2021 doi:10.5151/proceedings-ecaadesigradi2019_060.

⁵ In the Encyclopedia Britannica, “Atlas” is described as one of the Titans in Greek mythology, son of the Titan Iapetus and the Oceanid Clymene (or Asia) and brother of Prometheus (creator of humankind). Atlas was one of the Titans who took part in their war against Zeus, for which as a punishment he was condemned to hold aloft the heavens. In many works of art he was represented as carrying the heavens (in Classical art from the 6th century BCE) or the celestial globe (in Hellenistic and Roman art). Gerardus Mercator (1512-1594), a Flemish cartographer, made a series of publications with the intention describe the creation of the world and its subsequent history with a dedication to Atlas. This *Atlas*—the term still used to indicate a collection of maps—became the term to describe a systematic collection of ideas and images. Accessed April 28, 2021. <https://www.britannica.com/topic/Atlas-Greek-mythology> and <https://www.britannica.com/biography/Gerardus-Mercator>.

⁶ Ulrich Keller, “Visual Difference: Picture Atlases from Winckelmann to Warburg and the Rise of Art History,” *Visual Resources* 17:2 (2001): 179-199, accessed april 12, 2021 doi: 10.1080/01973762.2001.9658588.

⁷ Hubert Locher, “The Art Historical Survey: Narratives and Picture Compendia,” *Visual Resources* 17:2 (2001): 165-178, accessed april 12, 2021 doi:10.1080/01973762.2001.9658587.

⁸ Ching, Frank. *Drawing: A Creative Process*. New York: John Wiley & Sons, 1990.

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