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CREATING GUIDELINES FOR LANDSCAPE DRAWING IN DIGITAL MEDIA  
MA thesis

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## **Abstract**

The demand for digital drawing is incredibly high nowadays; more and more students choose it as a career path. However, the pedagogy in the digital sphere demands investigation at a substantial level. At the same time, very little research exists in regard to the pedagogical approach to the creation of a digital landscape. This study addressed this problem and offered a scheme that might be useful for digital drawing teachers and self-directed learners.

I began with recording face-to-face drawing sessions, with two participants, a teacher and a student, where the student followed the teacher's instructions. I recorded four lessons, both participants and their screen, transcribed the dialogs and coded every phrase that the teacher said. Then, I looked for similarities and differences in every lesson, trying to find the patterns.

I witnessed that there is a logic in the process of drawing a digital landscape. Patterns allowed to organize the instructions into distinct stages. Some stages considered to be important at the beginning of the drawing process, and others tended to appear at the end of the lesson.

This study proposed a scheme that might be used as the guidelines for drawing digital landscapes. However, the validation of the guidelines lied beyond the scope of this study.

*Keywords:* digital drawing, pedagogy, landscape.



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## **Introduction**

### **1. The context**

Being a practicing artist and an art teacher with a traditional background, I stayed distant from all forms of digital art. Getting in touch with the world of educational technology, I started to shatter the borders between me and digital art practice. Understanding that digitalization is not a controversial topic anymore, it has become a part of our reality, I carried out my personal investigation into this topic.

First and foremost, technologies have neither a positive or negative effect on artistic creativity (Chulvi et al., 2017). Digital art is equal to traditional nowadays. There is no doubt in the value of digital art, it is exhibited and purchased all over the world. Artists may express themselves in any form they desire. Art institutions much more concerned with other aspects of digitalization: how to preserve it in the space of an art museum? The traditional methods used for this goal could not be applied to a digital art form.

It is also reflected in studies that hand drawing has been slowly moved out of the curricula in architecture schools and the teaching of computer skills has taken over (Have & Toorn, 2012). Digital drawing is extremely popular with learners, almost every art university has a program dedicated to different variations of digital design.

Technology enlarges artistic vocabulary. Artists absorb and integrate the advantages of various art forms in order to create more outstanding works of art (Du et al., 2010). The latest computer technologies put forward the craftsmanship of many traditional branches, especially fabric printing, where the employment of technology may lead to the creation of a wider number of designs (Hu, 2016). At the same time, hand-drawing possesses many qualities that digital drawing lacks, hence, the merge of these two ways of artistic practice might promise the most fruitful results (Have & Toorn, 2012; Hawks, 2010; Lyn & Dulaney, 2009; Souleles, 2017). The productivity of an artist might increase with the use of digital tools, but elements of hand-drawing add individual features to his/her artistic style.

Some authors claim the economic transformation to be the characteristic of our time. That means shifting from the economy based on physical inputs to one based on intellectual inputs, or human creativity (Florida, 2006). Digital drawing perfectly fits into this concept.

Being a field where talent, creativity, skills, and business intertwine, digital drawing is one of the most desirable skills in the job market.

Concerning the landscape drawing, in traditional art school, this branch of art fills the niche between still-lives and drawing a human figure. Still-lives are of great importance in the first years of art education: the learning environment is entirely under the control in this case. A learner may focus on the basics of composition, perspective, color harmony, master different media, focus on depicting textures, and the illusion of depth in the picture. The landscapes are the next step in most of the art curricula in Russia. The reason for this is that at this stage, a learner should not only be able to copy what he sees but also to find concealed compositional structures behind the familiar to everyone's eye combination of trees, water, the ground, and the sky. The perspective in landscapes is way more complicated than in still-lives. The colors and shadows are changing quite fast, with the movement of the clouds and the sunlight. Plenty of artists dedicate their lives to the development and investigation of this genre, as it is possible to convey powerful messages through landscapes. Commenting on this, E. S. Casey (2002) writes: "Landscape paintings possess the decidedly non practical function of helping us to appreciate the natural world's inherent beauty and sublimity." As an art learner, I spent years mastering landscapes. My students follow the same path.

As in traditional art, digital artists who prefer drawing landscapes have a wide choice of spheres where they can utilize their talents. Game design, graphic design, illustration, architecture, and landscape design, to name some.

This sparked my interest in digital landscape drawing. If digital art shadows traditional (Tang et al., 2011), landscape drawing lessons must be an important part of digital education. Art and design education might seem very strict as first sight, but learning principles and concepts do not constrain the artistic freedom of an artist or a designer (Chandra Kruse et al., 2016).

## **2. The research aims and questions**

Taking into account that landscape drawing takes a prominent place in digital drawing education, there is little published data about the pedagogy or methodology of the creation of a digital drawing. This might be explained by the fact that usually, art teachers are active

practitioners, they do not focus on the academic discourse in the matter. The published materials are rather scarce and do not provide a comprehensive picture on the topic. Few studies investigated the sequence of the steps during the creation of a digital landscape, they are described in the next section. On top of that, the described studies do not demonstrate an agreement in this regard. This issue will be discussed later, in the section “Literature background”.

The specific objective of this study was to move towards the creation of practical guidelines that can be used by self-regulated learners and art teachers. With this in mind, the research proceeded by addressing 4 specific research questions, which would lead to the creation of the guidelines:

- What are the existing methodological approaches for drawing a digital landscape?
- How do these methods relate to one another? Are there any contradictions?  
Similarities?
- Is it possible to create a theoretical framework that will lead a learner to the creation of a digital landscape?
- Are there similarities between the creation of a landscape in a traditional medium and digital?

Answering these questions might be a valuable addition to the art pedagogy sphere. It is hoped that this research will contribute to a deeper understanding of the pedagogy of drawing digital landscapes.

One of the aspects of the present study was to investigate the intervention of digital media into the teaching process. There is a considerable number of studies that claim that digital technologies may be a powerful tool for supporting a learner. First, students prefer using computers to the traditional way of learning and this fact has a positive impact on the learning process (Tjaden & Martin, 1995). R. Willett (2007) pointed out the need for exploration of the way in which tech can support learners. Nagai et al. (2014) emphasized that tech is especially useful for budding artists.

This assertion leads us to the idea that digital pedagogy must be studied and improved (Tarakci Eren et al., 2018). Technology has a positive influence on teaching too. M. C. Manifold (2019) described a case study when she used a graphic editor to demonstrate the way to improve the drawing, without intruding into a student’s drawing. However, the

empirical evidence in this regard is relatively scarce; therefore, it is vital to pay attention not only to the students but to the teacher's experience.

Another aspect of the undertaken research was the development of drawing skills. This investigation did not present the full picture of the studies dedicated to the importance of drawing. Nevertheless, I would like to introduce studies supporting the improvement of technical drawing skills. A group of writers argued for technical proficiency to be the key to honing creativity in students (Chamberlain, 2017; Chamberlain & Wagemans, 2016; A. Kozbelt, 2004). There is another research (Biggio et al., 2015) that advocated for the significance of the development of visual thinking skills. The author claimed that they were neglected in the public education system; her study proved the connection between reasoning and imagery thinking. Plus, L. F. Arnold (2014) expressed concerns about the lack of research into the drawing abilities of average adults.

Developing drawing skills takes a great deal of time and effort. Professional instruction is a shortcut to mastering these skills. Developed teaching strategies have a positive impact on students' growth in the realm of drawing (Rankin et al., 2017). The main problem is that the existing teaching strategies are the result of life experience of the teachers and professional artists. Unfortunately, their teaching strategies are not usually evaluated with academic methods.

This thesis aims at the creation of guidelines. Further investigation can contribute to increasing their reliability. Data is collected, analyzed, and used to examine particular ideas. I gathered data in order to centralize myself as a researcher and experiment with data, which again, may be argued as a limitation of this study. In my opinion, the major limitations of this study are found in the scope of the participants, as all of them were from Russia. Art teachers from various cultural backgrounds would have provided more diverse perspectives as I suggest in the last chapter.

### **3. The structure of the thesis**

This thesis is divided up into six sections. The first section plays an introductory role, outlining the context of the study, research gap, research questions. In the second section, "Literature background", I look into the benefits and drawbacks of digital drawing. Then, I investigate the nature of the relationship between digital drawing and conventional. After

introducing the studies that see the influence of the traditional on the digital, I compare a number of methodologies for the creation of a drawing (both traditional and digital).

The next section is concerned with the methodology used for this study. The description of the participants and all the details of data collection might be found there. The design of the codebook using deductive and inductive methods is described there.

Section “Results” deals with the arrangement of the study results. Section “Discussion” analyses the results of video recording and focuses on the comparison of acquired data with the literature analysis from the second section. Through the discussion of the patterns of results, this chapter demonstrates the structure of the recorded lessons. And the last section, “Conclusions” suggests future work and deals closely with the limitations of this study.

### **Literature background**

Merging drawing and technology has become a widely discussed issue since the introduction of graphic editing software in the 1970s. A number of graphic editors have become an indispensable part of professional practice in all design disciplines, especially in landscape architecture education (Alagbe et al., 2014; Lee & Pae, 2018; Raaphorst et al., 2019; Tarakci Eren et al., 2018; Yildirim & Yavuz, 2012). R. Hanna (1998; as cited in Macdonald, 2014) outlined that conventional drawing with pencil and paper has been superseded by computer programs in conjunction with stylus and tablet. Further, most illustrators do not rely on watercolors and pencils any more, and the tendency towards digitalization has decreased the role of traditional media (Caplin & Banks, 2003). However, Hanna & Barber (2001) raised concerns about the lack of empirical research in this field; the impact of technology on creative processes has yet to be studied. This review focuses on the pedagogical aspect of digital drawing since education is the basic step in a career of every creative professional. Additionally, it attempts to shed light on the nature of the connection between digital and conventional drawing.

The purpose of this chapter is to investigate the theoretical framework related to the process of digital drawing. Moreover, it reviews some empirical studies in this area and represents opposing viewpoints on a topic. Trying to create a holistic picture, this review takes into account different pedagogical approaches.

The chapter consists of five parts. At the beginning, it reveals prevalent opinions on the relationship between traditional drawing and digital. It goes on to discuss the benefits and drawbacks of digital media. Then, it demonstrates several methodological systems for working with both conventional and digital media. Next, it considers the topic of pedagogical nuances connected to this particular field in greater detail. And finally, it outlines the presence of the research gap.

### **1. The strengths and weaknesses of digital drawing**

The academic literature discussing the benefits of the usage of digital tools has revealed the emergence of several contrasting themes. While a considerable amount of literature supported the beneficial role of digital media, there was a large volume of published studies which claimed the opposite.

The key feature that speaks in favor of digital drawing is the editability of images created with a graphic editor (Cantrell & Michaels, 2010; Piovarči et al., 2018). Replication and transformation are two other outstanding elements. The simplicity of replication and alteration of texture and layers is a breakthrough compared to traditional media (Cantrell & Michaels, 2010). As a result of this, the creation of digital images is possible in a shorter time, and a large number of variations might be created with less effort (Tarakci Eren et al., 2018; Yildirim & Yavuz, 2012). The latter study offered empirical evidence that digital work is more advantageous in a workplace organization since students who used a computer occupied almost twice as less space than students who worked with conventional media. In addition, digital images do not require physical space for storage. Plus, digital expression techniques are a better match for distance education. Moreover, participants showed a higher degree of satisfaction with the quality of their artworks when they used a computer. This might be connected with the other finding that highlighted the superiority of digital drawing in terms of photorealistic qualities (Kullmann, 2014; Tarakci Eren et al., 2018; Yildirim & Yavuz, 2012). Furthermore, the opportunity to record the process of drawing with the digital pen does not demand additional expenses and might be useful for learning and analysis of the drawing process (Cheng & Mckelvey, 2005; Koutamanis, 2005).

In contrast to these findings, a number of researchers shed light on the flip side of the argument. One of the distinctive characteristics is that computer drawing cannot provide the same level of physical interaction as traditional media (Hamilton, 2009; Piovarči et al., 2018; Roome, 2011). This might be the reason for the current dissatisfaction with the limitations in expressive ways (Koutamanis, 2005; Nagai et al., 2014). Another point that might have a negative impact on a digital drawing is that the exploration of digital tools is more time-consuming compared to ubiquitous pencils and pens (Takagi et al., 2003; Willett, 2007). Koutamanis (2005) postulated the next issue that might be disturbing for a novice: drawing with a regular tablet forces an artist to move eyes from the hand to the monitor, thus constantly interrupting the drawing process.

Thus far, even though digital media may offer a number of benefits, Cantrell & Michaels (2010) stated that technologies do not provide a shortcut to learning the fundamentals of drawing and illustration. However, a scarcity of research in this area does not allow us to agree with this statement completely.

## **2. The relationship between digital drawing and conventional**

Existing research does not appear to provide a solid answer as to what the role of digital drawing in students' artistic development is. The literature on the combination of traditional and digital drawing during education highlighted several aspects in this regard. The general advice was to stimulate hand drawing at the initial stages of education and then gradually introduce digital media to the students because traditional drawing skills are the foundation for digital ones (Biggio et al., 2015; Tarakci Eren et al., 2018). This is also stemming from the fact that the creators of digital tools used traditional ones as a prototype. Thus, drawing with original media must help a learner better understand digital media (Cantrell & Michaels, 2010).

Similarly, it was established that performing a design task, artists had to use traditional sketching techniques in the beginning and employ graphic editor software on the final stages of the process (Bradecki & Stangel, 2014; Edwards, 2008; Tarakci Eren et al., 2018).

On the question of the relationship between digital drawing and analogous, academic literature revealed the emergence of several contrasting themes. The assumption behind some of the previous research was that even though the physical processes of image creation are disparate, the fundamentals of art might be conveyed in the digital media as effectively as in a pen-and-paper manner (Cantrell & Michaels, 2010).

In contrast to these opinions, a number of researchers (Biggio et al., 2015; Edwards, 2008; Hamilton, 2009; Tarakci Eren et al., 2018; Yilmaz et al., 2017) maintained the idea that that digital drawing is not as beneficial for the cognitive development as traditional. In hand drawing, the brain tracks hand movements and wire it up with the image that the movements produce, thus establishing a better brain-hand connection. This way learners internalize images with the help of haptic sensation; such internalization is a key component of spatial thinking that is a core skill for every person. This allows people to model mental images of real objects and rotate them using imagination. With digital drawing, this chain is incomplete due to the removal of the tactile component.

### **3. The methodology of creating a digital drawing**

The section below describes the existing methodologies of creating a digital drawing. The main obstacle for writing this section was that there exist numerous artistic approaches that are designed by practitioners, but as soon as they are more based on personal experience of authors, they are not evaluated using classical research models.

The first system was introduced in the learning process in the education of graphic designers in 2010. Cantrell & Michaels proposed a scheme that consisted of four steps. Initially, a learner should organize a workplace by finding the most appropriate combination of software and hardware for the given task. Then, the exploration of digital tools must take place, together with memorizing hotkeys for repetitive tasks, which is essential for the forthcoming process. The next step is to look for digital photos that will play the role of the reference material. And finally, edit these images according to the instructions proposed by the authors (for example, how to draw trees, how to depict linear perspective, etc.).

The next instruction was suggested by a group of Japanese researchers (Nagai et al., 2014). The authors interviewed 5 teaching professionals and categorized their answers into a

proposed scheme. They noticed the following major drawing stages: (A) Outlining, (B) Shading, and (C) Texturing. Usually, these stages follow each other linearly, (A) is dominating at the beginning of the process, and (C) at the end. Also, they distinguished seven drawing steps:

1. Observation of the depicted objects;
2. Identifying the position of each part of the object;
3. Taking into consideration the specific proportions of the drawing area, outlining the composition of the depicting objects;
4. Capturing the form of the objects as a set of simple shapes;
5. Depicting the shapes of the objects in a more detailed and concrete manner;
6. Adding the texture to some areas of drawing;
7. Adding the finishing touch to the drawing work.

In addition, they emphasized a correlation between stages and steps. Some of the steps tended to be performed during the initial stage and some of them were characteristic of concluding the work. (A) related to 1, 2, 3, 4; while (B) consisted of 1, 5. At the same time, 1, 6, 7 were the constituent parts of (C).

Another solution for a drawing creation was described by the Netherlands research team (Raaphorst et al., 2019). They used Gillian Rose's theories of image representation, which were the adaptation of Michel Foucault's ideas related to the visual discourse. This study drew a connection between these theories and the landscape design. Rose's three aspects of visual discourse and Foucault's definitions of those aspects were conceptualized as three elements of visual discourse analysis: the arrangement of the participatory process (apparatus), the interactivity provided by the medium on which the image is presented (technology), and the visual rhetoric of the image determined by the validity and readability of the design presentation (rhetorical organization) (p.44). All the described levels during the creation of a landscape project happen simultaneously.

While arranging the participatory process stage, designers choose the physical and social surroundings of design sessions. Regulative powers that are part of this stage according to Foucault are either the commissioners, or teachers, or the rules of a design competition. The interactivity of the medium is explained by the ability to share knowledge during the design process. Altering the image is the representation of knowledge that a designer possesses. And the last component, the visual rhetoric is analyzed relying on the work of the

French philosopher Roland Barthes. Transferring his theories to the artistic realm, this stage is characterized by the choice of depicting style, color palette, and composition. This study revealed that designers may use the described components in several ways that showed the flexibility of the proposed scheme.

#### **4. The methodology of creating a conventional drawing**

Since the sources mentioned previously supported the position that digital drawing evolves from the traditional, this chapter reviews the most prominent studies dedicated to the methodology of creating a traditional picture.

Much of the literature emphasizes the importance of repeated practice in all the learning related to art (Bernstein, 1967; Edwards, 2008; Latash, 1998; Nagai et al., 2014; Takagi et al., 2003) since the trial-and-error process is the key feature of drawing.

Cohen and Bennett (1997) determined four phases that artists go through whilst creating a representational drawing.

1. Observation of the target object.
2. Composition and style/media choices: which part (of the whole) will be represented and which method she/he will use to represent the object.
3. Eye-hand coordination to represent what she/he observes.
4. Evaluation of the finished product, feedback, and going back to phase 3. This loop might be employed a number of times.

A group of researchers (Takagi et al., 2006, 2003) created a learning support system for beginners that scaffolded sketching skills. The authors observed sketching sessions and recorded the instructors' feedback to drawings. They analyzed and transformed data into a three-step pedagogical system that was imitated by software. In the earlier model, the presented leaning system could only analyze and provide feedback about the composition of the depicted objects. This model is supported by Huang & Chen (2017), who stated that the first stage of any representational drawing is composition. The latter study demonstrated the ability of the system to support all the three stages of creating a sketch:

1. A student creates an outline sketch (lines are thick and clear)
2. Then gradually adds value: the learner depicts shadows

3. The participant adds multiple grades of gray in lights and shadows (lines from the first stage become pale)

Another study (Weil & Belchetz-Swenson, 2007) focused on the process of creating a classical painting. The researchers investigated the painting technique of one of the most prominent masters, a Dutch painter Rembrandt van Rijn. They identified these stages as the core of the process of painting:

1. The preparation of the materials
2. Drawing a rough monochromatic sketch with a brush and a shade of a brown color
3. Creation of the underpainting
4. Painting top layers, from background to foreground
5. Painting highlights impasto
6. Scratching wet paint to create a difference in textures

The following system was proposed by a practicing architect and a teacher. Brian Edwards (2008) mentioned four main components of a sketch drawing, namely perspective, line, composition, and shading. However, he did not provide the order in which these elements should appear.

A group of researchers from Turkey (Yilmaz et al., 2017) analyzed a syllabus of the drawing techniques course in the Department of Landscape Architecture at Karadeniz Technical University. Based on that, they outlined a scheme for drawing a landscape.

1. Explaining the importance of the development of traditional drawing skills
2. Instruction on different pencil drawing techniques
3. The theoretical introduction of the importance of scale and measurements
4. Instruction on how to draw a landscape using section and elevation scheme
5. guidance on how to draw landscape elements: trees, stairs, furniture
6. Teach students how to draw 3d objects the way they are seen in reality

Another group of researchers (Rankin et al., 2011, 2017) conducted a series of experimental workshops that combined strategies for teaching dyslexic students and drawing instructions. The workshop was attended by both regular and dyslexic students. The proposed teaching scheme proved to be useful for both groups. The list of phases is described below:

1. Focus attention: choose an object being depicted and surroundings. identify the size of this object in the paper
2. A general overview of the task: give students a set of goals for the study session

3. Introduction of the key terms: contrast boundary, negative space, outline
4. A teacher should model the process using think-aloud protocols, introducing new frameworks of thought; the students also discuss the process and teach each other
5. Let students repeat the instructor's strategy with his/her support
6. Independent practice (during unsupervised sessions)
7. Repeat the demonstration

## **5. Pedagogy**

Turning now to the pedagogical component of drawing, this study reviews major strategies applicable to art education.

On the one hand, the oldest and most influential work, supported by a number of citations is Ruskin's bottom-up theory (Ruskin, 1971). It stated that artists change the way they perceive the depicted objects by ignoring the influence of cognition on perception. The existing concepts about the surrounding world interfere with the way how people perceive reality, and the ability to eliminate these perceptual biases helps artists to produce more accurate representations of the world. The author called it "the innocent eye", and attributed the production of errors to the lack of this skill.

On the other hand, Ernst Gombrich (1972) presented a top-down theory. He made a conjecture that the process of drawing heavily relies on the knowledge about a depicted object, such as anatomy, or perspective, or its structure. In this system, the accuracy of the drawing is achieved through a repertoire of algorithms. In other words, artists do not ignore what they know, but their perception is affected by some other class of knowledge.

Moving on now to contemporary studies, it is important to mention the idea of the advantageous position of those artists who combine both bottom-up and top-down processes in their creative practice (Ostrowsky et al., 2012). During various stages, artists may implement different strategies. For example, Aaron Kozbelt (2010) in conjunction with a group of researchers noted: "Bottom-up strategies may be most effective for resolving an object's two-dimensional proportions or clarifying details, while top-down strategies are likely to become more important for facilitating appropriate visual selection among experienced artists".

It is also necessary to discuss another role of a teacher, namely providing feedback and identifying mistakes. It is important not just to point out an error, but to diagnose the cause of it (Takagi et al., 2006). To scaffold learner's motivation, a teacher should not show them all their mistakes at once, but gradually introduce them to a student (Takagi et al., 2003). In a trial-and-error process, a teacher makes the student identify his/her mistakes, which is pivotal for his/her independent work (Hirashima et al., 1997; Reyna, 2011). Some writers (Cohen & Bennett, 1997) assumed that there are four factors that affect the accuracy of a drawing. They are lack of motor coordination, inability to decide which parts of an object to draw, ambiguity in the perception of an object, and inaccuracies in perceiving the drawing. This view is supported by the Japanese team (Takagi et al., 2006) that investigated the reasons for making mistakes while drawing. This paper outlines three degrees of immaturity that interfere with the drawing process. Immaturity in recognition is the hardest to diagnose since it occurs during the learner's mental activity. Next, immaturity in interaction planning might be observed when the learner fails to create a successful strategy for the improvement of his/her drawing. And finally, immaturity in action, connected with a lack of hand coordination in sketching.

Matthews & Adams (2008) went deeper into the phenomena that the previous article called as immaturity in recognition. They studied various misperceptions that may cause inaccuracies in drawings. As mentioned before, the knowledge about the depicted object might have a negative impact on the drawing outcome (Arnold, 2014; Cohen & Bennett, 1997; Cohen & Jones, 2008). For instance, people tend to draw objects more circular and ignore the perspective changes while drawing round shapes (Taylor & Mitchell, 1997). Another study (Mitchell et al., 2005) proved that perspective cues make people misperceive the sizes.

## **Methodology**

This section describes the study's methodological approach and research design. In the beginning, I explain why I chose qualitative methods for this study. The explanation is followed by a brief description of the theoretical framework. Then, I describe participants and the procedure of data collection. The major ethical issues are addressed in the following subsection. The frameworks I use for presenting findings and analyzing data are also explained.

## 1. The theoretical framework

My research project is qualitative. The term “qualitative” is broad and was redefined a number of times, since the introduction of this term in 1985. I will use the definition, offered by Lichtman (2012, p. 7): “Qualitative research is a general term. It is a way of learning in which a researcher gathers, organises, and interprets information obtained from humans using his or her eyes and ears as filters. It often involves in-depth interviews and/or observations of humans in natural, online or social settings. It can be contrasted with quantitative research, which relies heavily on hypothesis testing, cause and effect, and statistical analyses.” The core of qualitative research is the description, understanding and interpretation of human behavior. That is why the choice for the methodology was obvious: my research goals implied working with data, gathered from human behavior. I needed to categorize and generalize how a teacher may scaffold a learner during a landscape drawing session in order to understand in depth the nature of this process. The use of qualitative methods made such an investigation possible.

My study design is based on the controlled observation method. I did not join the lessons, that is why I cannot classify my study as participatory. I chose where the observations took place, at what time, with which participants. Participants were randomly allocated to each independent variable group. The observational nature of this study was the most appropriate option for the solution to the existing problem because only by observing real lessons I could see their structures. The benefit of this approach is that it might be conducted without a pre-existing hypothesis. The aim of this study was to unite existing theories into a practical guide and to check the relation of the mentioned theories to pedagogical practice. I observed lessons and compared the results to the theoretical literature available in the field. Participants were aware of the observation.

However, I did not observe only the participants’ behavior. After transcribing the audio from the lessons, I analyzed the generated texts. Usually, this step adds the features of narrative or thematic analysis to the study. In my case, the major part of the study relied on deductive coding, with features of open-coding. The mentioned methods are described in the “codes” subsection.

I measured neither the quality of drawing or the level of students' satisfaction. The only criteria for work were the absence of blank spaces on the picture and distinctive features of a landscape in the picture. Teachers decided when the drawing was finished according to their opinion.

## **2. Data**

### **2.1 Participants**

In the study, we had eight participants who were grouped in dyads. Four of them took the roles of the teachers and the other four took the roles of the learners. The participants who played the roles of the teachers were graphic designers. Thus, I had one male and three female teachers within an age range between 27 and 35 years. The requirements for participation in the research were having either the work experience in landscape drawing in digital media or the relevant education. All of them had MA degrees related to the field (architecture and art pedagogy). All of them had graduated from Russian universities and worked in Russia. The willingness to be observed and video recorded was also important. Three women and one man, all of them came into contact with me years before the investigation took place. I offered them to participate after a couple of people referred to them as reliable high-skilled designers.

The other four participants who took the roles of learners. The level of their drawing skill was not taken into consideration, but I gave priority to those with a low level of drawing skills and the absence of experience with graphical editors. One of the participants had some experience with digital and analogous drawing, one had experience in only traditional drawing, two learners were newly introduced to both digital and analogous drawing. The age of the participants was between 18 and 30. "Learners" were recruited randomly; the four women met me before and showed their interest in the development of the study. I contacted them via the social network "VK." Learners were assigned to teachers based on their schedules since the lessons could be organized as their recreational activity because they did not relate to their professional development.

I began the recruitment process in December 2019 and finished it in January 2020. It overlapped with recording lessons. All the events took place in Tyumen, Russia. Neither teachers or students had financial or other kinds of compensation for their participation.

## **2.2 Data collection**

For the purpose of the study, four study sessions were organized. One group (one teacher and one learner) had only one study session. In order to collect more detailed data, every teacher gave only one lesson and every learner could participate in only one lesson. Such measures guaranteed having differences in the instructions.

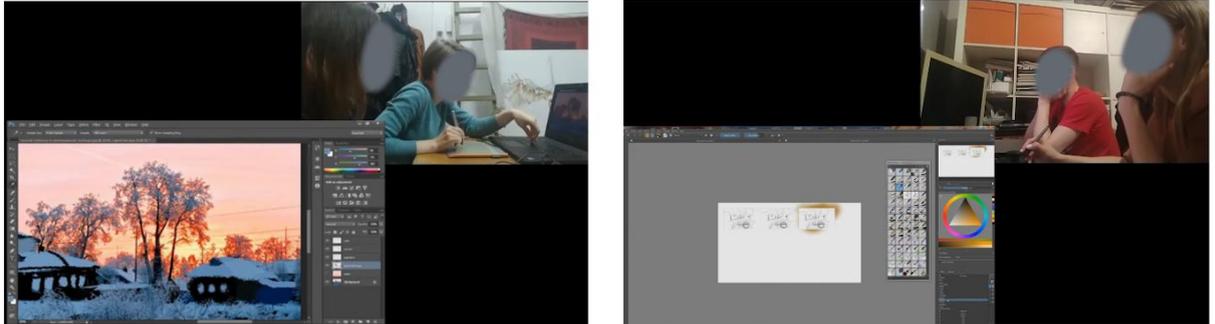
Lessons took place in Tyumen, Russia in January 2020 between 10th and 20th. Every lesson was face-to-face, the instruction language was Russian. One teacher worked with one student. Even though the length of the lesson was not set, teachers were free to adjust the time of the study sessions, they lasted from 50 to 90 minutes. The lessons had the same topic: digital drawing of a landscape. The choice of the software that teachers used was free, three teachers used Adobe Photoshop (<https://www.adobe.com/products/photoshop.html>), one preferred using Krita (<https://krita.org/en/>). Both programs classify as raster graphic editors.

I carried out observations, taking down notes and audio/video recording the lessons. While a teacher worked with a student, I was in the same room, checking the recording process. I did not interact with the participants during the lessons.

During every session, a teacher gave instructions on how to draw a landscape from scratch. Students followed the instructions, using drawing tablets and styluses. Lessons took place in informal settings, at the homes of participants. All the distractions were zeroed out. Students followed the teachers' instructions. Teachers could choose any pedagogical strategy they assumed appropriate, so this variable was totally independent. To see the drawings, created during the lessons, go to Appendix 11.

Lessons were recorded with the smartphone's built-in camera (Xiaomi Mi A2), attached to a tripod. Simultaneously, OBS software recorded the process of drawing. Then, I synchronized two videos and positioned them in one frame with the help of Kdenlive software.

*Figure 1. The screenshots of the transcribed videos.*



### 3. Ethical concerns

All participants signed up the research informed consent forms (see Appendix 12). The study adopted these principles: designed as beneficial to participants and all the risks were eliminated. Participation was anonymous and confidential. Additionally, every person had a right to withdraw from the research.

## Results

### 1. Data analysis

The aim of the data analysis was to extract - from the participants' practice - cues on how to create a digital landscape. To begin the analysis process, I transcribed all the video material. For identification of the timing and speeding up this process, I used an online video-sharing platform YouTube. This platform generates automated subtitles. I marked all the videos as private and deleted them after transcribing. I corrected auto-generated subtitles manually. Using Google Spreadsheet, I arranged the text in three columns, namely: time, the teacher's speech, the learner's speech. The fourth column was left for codes that indicated the stage of the process. The columns 2,3 were in Russian, and 4 in English (Table 3, see Subsection 4).

At the same time as transcribing the lessons, I derived a list of codes from related literature presented in the second section. To synthesize and compare the codes coming from literature I put the results in Table 1 (see Appendix 1). The table shows the relationship between various theoretical studies related to the creation of a drawing. It outlines similarities and differences between presented studies and shows how the authors see the process of creating a drawing. There are seven rows with the names of authors and the year of publication. Seventeen columns represent stages mentioned in the articles. The last row in the table represents codes that I planned to use for analyzing the materials. To name the codes, I shortened the names of stages. The mark “X” in the cells indicates the absence of the stage in an article. When the stage was mentioned in a guideline, I wrote down its number in a relevant cell that demonstrated a place of the stage in the article. I organized articles related to both digital, and conventional drawing because one of the research questions was to investigate the correlation between them.

The table shows that some stages are obviously more widely accepted than others. Five out of six papers write about the importance of composition and drawing the details. Four out of six authors underline the importance of adding texture. Two authors agree that the preparation of the material and software should be at the beginning of the process. Other categories matched rather seldom, but it was still crucial to look for them in the transcribed material.

In the follow-up phase of the study, I created a codebook (the codebook is introduced in the “codes” subsection) and checked if all of the codes mentioned in the literature were present in the study sessions. The next stage of the study comprised an arrangement of codes according to their place on a drawing timeline. And finally, I substituted every code with teachers’ instructions translated into English. As a result, I presented a list of guidelines that teachers or self-directed learners may use for drawing a digital landscape. Every step of data analysis is closely described in a relevant subsection.

## **2. Comparison of the theories**

In this section, all the results from the analysis section are presented and examined in detail. The following describes the codebook that was the central tool in processing the textual data.

Then, it reveals the patterns of codes that appeared in the recorded lessons. These patterns might be organized into a scheme that may be used as a guideline. The scheme is proposed and discussed.

Not all articles presented in the literature background section could be used in the composition of a codebook. One article did not fit into the table, the other three could be used partly. Some studies (Raaphorst et al., 2019) discussed the matter in a broad sense and did not describe the practical components of every stage. So, I did not use their study in the analysis of gathered data. Similarly, the other paper (Yilmaz et al., 2017) did not fully explain the stages of the educational process. The reason for this was that it lied beyond the scope of the study, the researchers analyzed the curriculum of the drawing course, they did not aim for a thorough description of the drawing process. Nevertheless, based on their article, I added another code to the analysis. “The theoretical introduction” inspired me to create a code that I called “theory.” This category also emerged in another paper, (Rankin et al., 2011, 2017). The first three stages described in this study supported other authors, but the last four stages recommended observing the work of a teacher, copy it, then imitate repeatedly without the teacher’s intervention. As this study is more interested in what teachers do to explain the material to learners, the chain of actions described there did not provide insight into the topic. I will elaborate on the meaning of codes later in the text.

The last article in the list (Edwards, 2008) did not articulate the order of the stages, the author pointed out only elements of the drawing process and did not highlight their order. That is why I marked the presence of these elements with “0.”

### **3. The codes**

Arranging a codebook is pivotal in the qualitative analysis. For the most part, I employed concept-driven coding, 18 codes were derived from the related literature. The last code emerged from the analysis of transcribed lesson recordings, adding open-coding features to the process.

During the first cycle of coding, I noticed that some teachers emphasized that the process of drawing is not linear, so they offered a student a number of options on what to do

next. I labeled these phrases as “options”. The detailed description of this emerged code is in the codebook.

The codebook aims to provide a clarification of the meaning of every item. A clear understanding of every code assists the coding process, making it more accurate, therefore more reliable. The number of codes is optimal because a researcher should be able to keep all the codes in short-term memory. Tracy (2019) advised keeping this number less than 25.

I arranged my codebook as a table. There were 6 columns, namely: code, short description, detailed description, keywords, sources, examples. The “code” column contained the names of the codes. The “short description” column summed up the meaning of the code, while the citations and explanations might be found in the “detailed description” column. The column “keywords” included words signaling the belonging to this code. And in the “examples” I translated teacher’s phrases that fell into the described category. This codebook (Table 3) might be found in the appendix. The short description of codes is presented below in Table 4.

**Table 4. A short description of the codes.**

#	Code name	Code short description
1	Preparation	All actions that precede the process of drawing: preparation of the materials and check software
2	Tools	The instructions that explain the functions of a graphic editor
3	Reference	Find a reference image
4	Edit reference	Draw on the reference, cut it, use it directly in the image
5	Observation	The process of looking at the reference and identifying important features
6	Position	Identifying positions of each part of every object
7	Composition	The position of elements in the picture
8	Simple	Drawing simple shapes

#	Code name	Code short description
9	Details	Work on parts of an image
10	Texture	Depict the texture of different objects
11	Finishing	Look at the whole drawing and add a final touch
12	Style	The choice of drawing style
13	Evaluation	Feedback on the work done
14	Loop	Change a detail that was created before
15	Underpainting	The first layer of color
16	Line	Line sketching
17	Perspective	Perspective
18	Options	The ability to choose one or another action while drawing
19	Theory	The rules for drawing

#### **4. The process of coding**

Since the data sample was not extensive, I did not use coding software to automate the process. I divided the initial texts into smaller chunks of information because I aimed for detailed, descriptive data. I grouped together sentences related to the same action on the screen. Every block that a teacher said was analyzed on the presence of the keywords. If there were not keywords mentioned, I focused on the meaning. The meaning of every phrase was supported by a video recording of the student's actions at the moment. I used Google

Spreadsheet as a tool. Table 3 presents an excerpt from one of the transcribed texts during the first cycle of coding.

**Table 3. A fragment of a transcribed text.**

Time	Phrase of a teacher	Phrase of a learner	Actions	Code
17:43	Yes, it does not fit here... You can move it yourself, find a position with these buttons. This one stretches the image.		A student presses the mentioned buttons and moves a frame.	Tools
18:07	Which composition do you like? We will use it for the rest of the lesson.		A student looks at the sketches	Evaluation
18:15		This one, without boats, will be easier.	The student chooses the sketch for work	Evaluation
18:18	Yes, this version is easier.		The teacher approves the choice	Evaluation

While coding, I used deductive (concept-driven) coding, as I had a predefined list of codes. I did not modify the code definitions, as I described them citing the sources. Occasionally, I met phrases that I could not associate with any of the existing codes. I marked them down with a "?" sign. This added to my coding process the features of open-coding. I noticed the patterns in the "?" group: one teacher a number of times offered his student several paths of the image creation. I named this newly emerged group as "options" and reread previously coded text again, looking for bits of text that could go in line with a new code.

The coding process consisted of three cycles. I coded independently, thus, the validity of the findings might be limited. This limitation should be addressed in future work, having more members in a coding team would lead to the production of more reliable results.

Although it would be easier to have a hierarchical coding frame for the sake of creating a guideline, the theories were not in full agreement in this regard. So, I started with a flat coding frame.

### 5. Codes in the transcribed text

The coding revealed the patterns in the recording lessons. Most of the codes appeared in the texts. This might lead to the unification of several theories. The categories listed below constantly emerged in teachers’ speech:

- Reference
- Tools
- Observation
- Composition
- Simple
- Details
- Texture
- Evaluation
- Loop
- Line
- Theory
- Preparation
- Underpainting

Some of the predefined categories were not found: edit reference, position, style, perspective, finishing. This issue will be discussed later. Also, the first cycle of coding identified the newly emerged category, “options”.

Table 4 compares the presence of the codes in the recorded lessons. Figures 1-4 demonstrate the codes in a more detailed manner. The figures are in the Appendix section.

**Table 4. Codes in the lessons.**

	reference	tools	observati on	compositi on	line	details	simple
lesson 1	+	+	+	-	-	+	-
lesson 2	-	+	-	+	+	+	+
lesson 3	+	+	+	-	-	+	+
lesson 4	+	+	+	+	+	+	+

	texture	theory	loop	evaluation	preparatio n	underpain ting	options
lesson 1	-	-	-	+	+	-	-
lesson 2	+	+	+	+	+	-	+
lesson 3	+	-	+	+	+	+	-
lesson 4	+	+	-	+	+	+	-

Closer inspection of the table shows that all lessons had quite a lot in common. All the teachers explained digital tools, focused on drawing details, evaluated students' work, prepared software, and hardware to the sessions. Three out of four teachers used references for drawing, the same teachers stimulated students to observe these images during drawing. The same proportion of participants insisted on starting drawing with simple shapes, adding textures. Half of the teachers dedicated some of the study time to the discussion of the composition, the same groups drew the first sketches linearly.

To get closer to the creation of the guidelines I created figures 2-5 (see Appendices 3-6), where I linearly arranged codes by their appearance from the beginning to the end of every lesson. The structures will be compared in the following subsection.

Overall, these results revealed the patterns of data that might be the core of a guidelines system for landscape drawing in digital media. The next chapter moves on to discuss the possible combinations of the parts of the lessons to propose a new drawing model.

## **Discussion**

This section addresses the main research question: creating a digital landscape has a plain structure. What is it? To address this research question, this section builds upon the findings of the previous two sections to contribute to an advanced understanding of the context. Initial analysis centers on the published literature, then it adds the data from the recorded lessons and attempts to process it.

In the second section, I outlined the studies that intended to find an effective scheme for drawing. There was no consensus between them either on the number of drawing stages, or their sequence. In addition, the interview of four art teachers drew attention to additional elements that did not fully overlap with what found in the dedicated literature. In this section, my aim was to articulate and discuss a number of guidelines that can be derived by the synthesis of literature and the main findings from the interviews with the teachers. Since it was not possible to derive the united system from the literature, the findings revealed a pattern of results that allowed me to indicate a number of guidelines. The analysis in this section explores how a guideline might unite both previous research and newly emerged

findings. The additional investigation explores the possible variations and limitations of the proposed scheme.

### **1. Lessons' structures**

This section will explain in detail the development of codes hierarchy. At the beginning of the analysis I could derive from the relevant literature only a flat coding frame. This subsection will attempt to develop on the coding frame, for the sake of making a guidelines' structure more precise. Understanding the structure of every lesson could be the first step towards a big picture. To see the structure of every lesson, I simultaneously watched the screen recordings and read the transcribed texts with codes assigned to every event. I organized the codes linearly in the sequence they emerged during the lessons. I inserted the figures in the appendix (Figures 2-5).

Overall, these results revealed the patterns of data that might be the core of a guideline system for landscape drawing in digital media. It is apparent from the figures that although there is a linear sequence of codes, for the most part, they tend to intertwine and appear in groups at the same time. It is noticeable that the explanation of digital tools did not take place before the lesson as it was proposed in the original source of the code (Cantrell & Michaels, 2010). In two cases it happened at the beginning of the lesson and during the study session. In the other two cases, teachers helped students with drawing instruments every time when it was necessary. So, "tools" remarks permeated almost every stage of drawing. This might be related to the nature of learning: to move a new piece of information to long-term memory, a person should constantly repeat it. Moreover, the practical application of theoretical knowledge drastically increases the chances to assimilate it. That is why, I believe, that the findings might be a reliable addition to the existing knowledge.

Comparison of the findings with those of other studies confirms that working on details is an inseparable part of the drawing process. Having appeared in four out of five sources, this category was the second shared feature of all lessons. It might be explained by the fact that historically, the essence of drawing was in the depiction of objects, it was the fundamental part of the drawing process. The easiest part of the drawing is to represent a piece of reality, but art students dedicate years of practice to learn how to harmonically

combine a number of different objects in one space. The crucial addition is that closer examination of the “details” category shows that the process of drawing details was similar in all lessons. The steps that precede the details drawing stages were different, although with an agreement to some extent.

Another feature that was noticed between the samples, is that three out of four teachers structured a lesson around copying a reference image. The lesson that did not follow this pattern demonstrated a path of creating a landscape from an artist’s imagination. This might be a possible explanation for this discrepancy. I consider it a valuable addition to the guidelines and the future investigation, as drawing from imagination is one of the hardest tasks, even for experienced artists.

Surprisingly, the “composition” element was only discussed by half of the group. This contradiction with the literature might be explained by the fact that two teachers were focused on students copying the reference. This way, they did not set changing or creating a better composition as the goal of the lesson. This point needs a more detailed examination in a future study.

Looking closer at the lessons’ structures, it is standing out that three out of four lessons had a plain linear structure. What was striking about Lesson 1 (Figure 2, see Appendix 3), that it had the most uncomplicated structure. The student, following the teacher’s instructions, started depicting objects from ones that were closer to the background, moving to the foreground. The structure of Lesson 3 (see Appendix 5, Figure 4) was similar to those that we saw in Lesson 1, but it was moderately expanded. The teacher paid more attention to the details, he evaluated a student’s work more often, stimulating a student to go back and improve the finished elements. This teacher paid more attention to drawing the details, carefully explaining every step. Supposedly, that was a reason for the appearance of different codes while a student was drawing. From the data in Figure 5, it is apparent that the last lesson was linear as well.

The differences between lesson 2 and the others are displayed in Figure 3 (see Appendix 4). This teacher revealed the non-linearity of the drawing creation, thus reflecting the complexity of the drawing process. Notably, this result has not previously been described. Also, it is worth mentioning that this teacher did not use the reference image. That is a possible explanation of why the “observation” category did not emerge.

Thus far, outlining similarities in the lessons' structures and their constituent components may give us a way forward to the creation of the unified scheme. The next subsection will attempt to prioritize the existing elements of every lesson, to make the guidelines from those that are more reliable.

## **2. Prioritizing elements**

Including all the findings into a future model would raise more doubts about the proposed scheme. I felt the need to perform the meticulous analysis of the data, in order to create a more reliable system. This subsection describes the steps that let me complete the guidelines for drawing a landscape with a graphical editor.

To find the core of the future model, I went through the lessons' structures another time. I outlined the elements that appear in all samples with a dark green color. The categories that are seen in three out of four cases were marked with a light shade of green, they will be included in the final model, but with a lower priority. These elements should be the core of the future model. Those categories that appear only in half of the lessons were marked with yellow. And finally, those that were seen only in one example were associated with red color, as the steps needed more attention.

In spite of the fact that only two out of four teachers mentioned the "composition" category, I decided to include this code in a green rectangle group because it was one of the most repetitive codes in the literature.

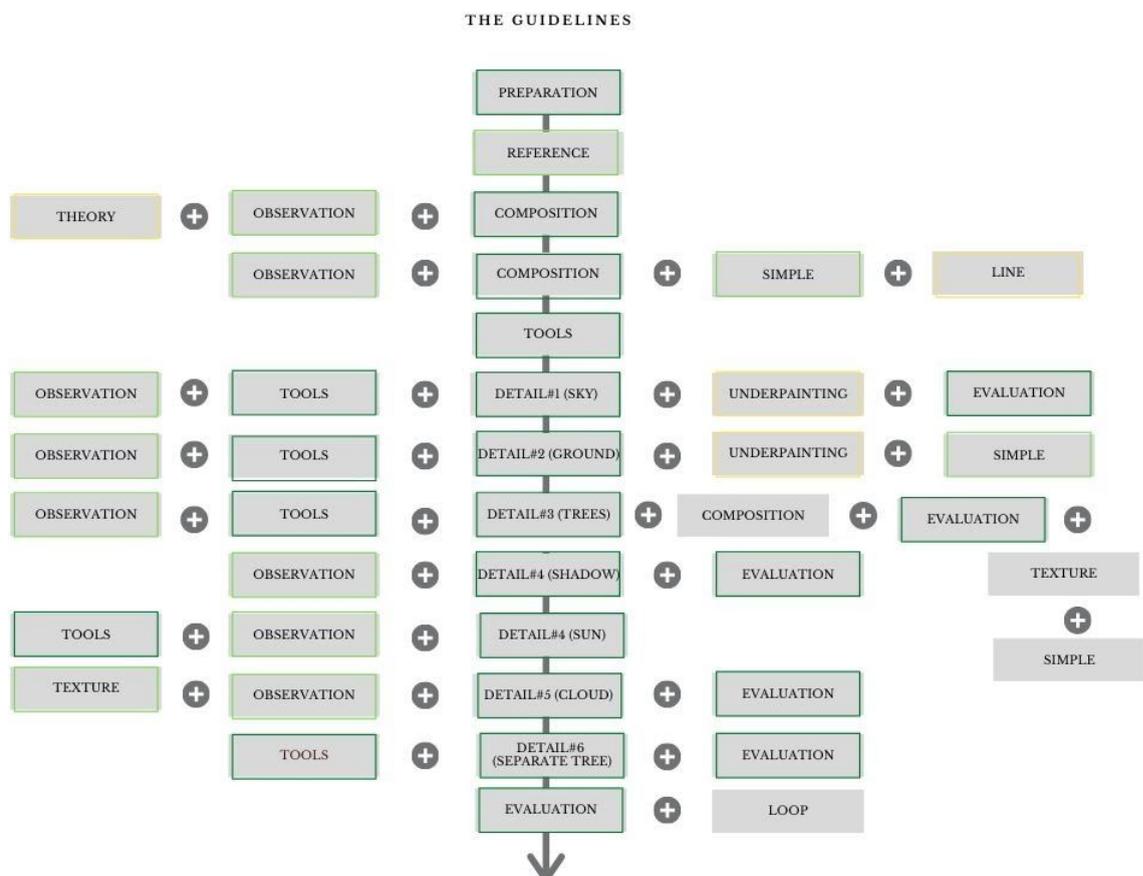
The color-coded structures might be found in the Appendix. Figures 6-9 relate to lessons 1-4 and demonstrate parts that should stay in the final model. Those that might be left out marked with red color.

All red blocks belong to a newly emerged code. Although this category might lead to the development of knowledge in the field, there is not enough data to support this finding. The fact that this lesson was based on a different task (drawing a landscape using imagination) may explain the lack of supportive data. Thus, identifying the variety of landscape drawing tasks might lead to the development of different learning models.

Coloring gave the impression that lessons 1, 3, 4 could be used as the core of a future model. Lesson 2 stood out of the group, and I decided to use quotations from it to support the

ideas of the other teachers. The mainline of actions is similar in all codes, so I took it from lesson 4, because it is composed of only green items. Then I added yellow blocks as optional and green boxes from horizontal hierarchies. The final figure, combined from all units is presented below (Figure 10).

*Figure 10. The structure of the guidelines*



This figure is drastically different compared to any of the literature sources, though it has similarities with many of them. The structure, for the most part, relates to Cohen & Bennett’s (1997) article where the authors proposed the following chain of actions: observation of a depicted object - composition and style choice - drawing the details - evaluation and going back to improvement of the details. At the same time, this figure shows the importance of the finding of a Japanese group of researchers (Nagai et al., 2014). Three

steps of their scheme elaborate the work of the previous authors, adding significant features to the vertical structure: every detail should be depicted as a set of simple shapes first, then artists draw this detail more closely, and finally, they add texture. These steps enrich the vertical structure, adding a horizontal hierarchy to the “details” stages.

It is standing out that Figure 10 on the one hand supports Cantrell & Michaels’s book (2010), exactly the part that advised using reference images while drawing and studying the tools before the drawing session. Two of the teachers in line with that explained the tools before starting drawing. On the other hand, it proves that studying tools might take place simultaneously with learning how to draw. The other two teachers gave instructions on the digital instruments during the whole length of their lesson. Even those, who explained the tools at the beginning of the session, repeated the tips later.

Figure 10 supports two Japanese studies (Nagai et al., 2014; Takagi et al., 2006, 2003), that offered to draw linearly during the first stages of drawing. Later the lines may become pale and in some cases totally disappear. Two of four teachers confirmed this, asking the students to start with the creation of the linear sketch.

To sum up, these findings, while preliminary, suggest that the scheme described in the following subsections may play a central role in the further development. However, It is important to bear in mind the possible inaccuracies of the initial, newly emerged scheme.

### **3. The guidelines**

This subsection describes the way in which the findings of the present study can lead us to the articulation of a system that can be used for drawing a landscape. All the major constituents relate to previous research and the presented study’s findings.

To arrange the guidelines, I copied the events (phrases marked with codes) from the transcribed text into the category that represents those codes. Next, I translated them into English, as the original language of the lessons was Russian. The phrases of different teachers did not contradict each other, they complement each other in all categories. The phrases that repeat the meaning of other instructions were removed. The guidelines arranged from the data obtained in this study might be found in Table 5.

I would like to emphasize that the proposed guidelines should not be treated as a final product. It is an interim scheme that must be checked and validated in a consecutive study.

***Table 5. The guidelines***

#	The name of the stage
1	Preparation
	Get ready for the drawing session. Check if the stylus and tablet are connected. Check if the graphic editor runs on your computer. You might need the internet connection working as well. You also might need a pencil and a piece of paper.
2	Reference
	One of the most popular ways to master drawing is to copy a picture. Find a reference image that strikes you.
3	Composition, observation, theory
	Look at the picture. Before you start drawing, you should analyze the future image. Pay attention to the colors. What colors do you see in the reference image? Squint your eyes to identify the darkest place in the picture. Look at the image, there are three parts, foreground, middleground, and background. Which objects belong to every layer? Start drawing details from the background, then move to the middleground, and eventually work on the foreground. Count the number of objects. When you draw, you should represent every object on a new layer, this will help you edit images easier.
4	Composition - practice
	Draw fast during this stage! You may sketch a simple scheme of your future drawing on a piece of paper. It is faster in the beginning, but when you get used to the program, you can do it on the computer.

You need to start with the composition sketch, it is a model of your future drawing. Draw there all the elements that you have in the reference. You need to find which elements are bigger. Every object should be in its place. Do not draw details! Only big shapes. This drawing is black and white, made up of lines.

Start with the horizon. There is a tip for a beginner: draw the horizon on one-third of your paper. Make the sky two times bigger or two times smaller than the earth. They should not be equal! Equal parts do not look good. When you become more experienced, you can play more with these proportions.

Find a composition center. The composition center is the main object in the picture. Think about how your gaze travels in the picture, usually, you start looking at the main object and then observe the other parts. The composition center should be close to the geometrical center, but it should not be exactly in the middle of your paper. This will make your drawing more dynamic.

You may leave empty space between the objects. Do not try to fill the whole drawing space, pauses are important.

Important tips:

Draw the objects with simple shapes, look if they are close to circles, triangles, rectangles, squares.

Do not draw every object (tree, house, mountain) individually, when they are in a group.

Start with the outline of the borders of this group.

Usually, artists draw on a size that is two or three times bigger than the final size of the drawing. When you finish the drawing, make it a regular size and all the details will look better.

Always start drawing from big shapes, then you will work on the details inside of them.

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## 5 Tools

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Here's the list of tools that you need to know to begin using the graphical editor: brush, opacity, eyedropper, layers, eraser, lasso, selection, overview, gradient, bucket, zoom.

These guidelines did not aim for explaining how to use the instruments. There is a variety of graphical editors on the market, but they all have similar functions.

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Tips for drawing details: you may change the given order of drawing details, as different pictures had various elements. There was not seen an apparent consistency in the drawing the details sequence in the observed lessons. The only detected pattern was that most of the teachers guided work from the background to the foreground. If you expressed the previous step on a piece of paper, start working in the program.

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6           Detail # 1 [sky]

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Underpainting: first, fill the whole sky. You may fill the whole virtual canvas with the color of the sky. Check which part of the sky is darker. You may use either gradient or a big brush.

Compare the drawing to the picture, then make it look closer to the original.

If you cannot find a color, use the tool “eyedropper”. But remember, looking for the right shade of color manually is better for your artistic development than using the “eyedropper” tool.

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7           Detail # 2 [ground]

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You need to draw a horizon. Start with big brushes, with a basic color. Then add smaller strokes with an additional color. Remember tips for finding the horizon line from the “composition” subsection.

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8           Detail # 3 [trees]

---

What is the shape of the tree group? Outline it. Choose the color of the trees. Start with the trunks, continue with branches, then draw the crone. Drawing trunks, do not place them with equal spaces between them. Add a texture to the crone. In a group, do not draw individual trees, draw how they are connected together. First, paint everything with the basic color, then paint the details on top of that. When you have trees painted like one shape, add shadows.

Draw parts of the trees on different layers, it is better for editing.

Look at the drawing in an overview mode. You can see what to improve now. Use the tool “overview” or “zoom” to see the whole image. When you look at a detail for a long time,

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you may make a lot of mistakes. Check, if you are on the right way by looking at a smaller version of your drawing.

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9           Detail # 5 [clouds]

---

Find the color of clouds, do not paint with the lines, use a big brush. Add different colors. Add texture.

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10          Detail # 6 [architecture]

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Start with simple shapes. Take a bigger brush. Then do the details. Roofs, windows. Draw details on new layers. When you draw two objects, look at their edges, and compare the colors and value.

Check your work, improve the details, go to the next detail.

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11          Detail # 7 [bushes]

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Use a big brush and fill the whole mass of the bushes. Then add branches and texture.

Look at them and compare them to the reference.

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12          Evaluation

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After you painted all the details, look at the whole picture and evaluate how these elements look together. Compare to the reference, change the details you do not like.

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#### **4. Concluding remarks about the guidelines**

The present results are significant in at least two major respects. First, they show the possibility of merging several existing theories. Second, they propose a new, more elaborated model of creating a landscape in digital media. There is abundant room for further progress in determining the order of some steps, namely the drawing details. None of the teachers determined the principles of organizing the sequence of working on details. Neither of the literature sources expressed an opinion on this issue.

Although the use of preliminary drawing on paper was expressed as possible by a number of previous studies, only one teacher employed this in practice. Further research should be undertaken to investigate the necessity of this step. In addition, further work is required to establish the plausibility of the guidelines.

Even in such a small sample, we witnessed the presence of several drawing purposes: teaching, how to copy the reference image, and instructing, how to create a landscape from the imagination. I see it as an important issue for future research, as it might reveal different strategies for landscape creation. Stinging out of the recorded material, Lesson 2 poses new questions that are still not answered: what is the nature of a non-linear drawing lesson? Is it beneficial for drawing? In which cases does it have a positive impact on drawing? Is it necessary not to use references while drawing from imagination? May reference images scaffold the creation of imaginary landscapes?

## **Conclusion**

Digital drawing is ubiquitous and educators should take into account all aspects of it. The construction of effective scaffolding is the goal of every teacher. In this investigation, the aim was to combine a number of existing theories and compare them with real art lessons. This study set out to compare seven studies and it pointed out similarities and differences between a number of pedagogical approaches.

The findings of this study indicate that the creation of a digital landscape might be as a result of a number of consecutive steps. However, the sample used for this study was relatively small, so the results should be validated with a larger number of participants in a future investigation. Also, the lack of participants' diversity did not allow generalizing the findings on the international level. I suggest repeating the investigation with an international group of instructors since the diversity might be related to cultural backgrounds. Russian art school differs from the European art tradition, so including international instructors into the study might give a valuable addition to results.

These findings may be somewhat limited by the small number of participants. To develop a full picture of digital landscape drawing, additional studies will be needed on the appearance of the codes in the face-to-face lessons and the lessons' structures. Thus, the final

model could be more conclusive. Moreover, further work is required to establish the viability of the proposed scheme.

Overall, this study strengthened the idea of the existence of multiple stages in the drawing process. It proved that some stages are an inseparable part of a drawing process, and some did not appear in the teachers' narratives.

Another purpose of this study was to construct a guideline that might be of interest to educators and self-directed learners. The study identified 12 major steps in the process of drawing a landscape. The validation of this guideline lies beyond the scope of the current study. A natural progression of this work is to confirm this guideline with a group of students. To sum up, this study went some way towards enhancing our understanding of the process of creation of a digital landscape.

To sum up, this study went some way towards enhancing our understanding of the process of creation of a digital landscape.

### **Acknowledgments**

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### **Author's declaration**

I hereby declare that I have written this thesis independently and that all contributions of other authors and supporters have been referenced. The thesis has been written in accordance with the requirements for graduation theses of the Institute of Education of the University of Tartu and is in compliance with good academic practices.

Antonina Korepanova

04/06/2020



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**Appendices**

**Appendix 1. Table 1. Codes derived from the literature, part 1**

	Prepare the software/materials	Study digital tools	Find referencing material	Edit referencing material	Observation	Identifying the position
Cantrell & Michaels (2010)	1	2	3	4	x	x
Nagai et al. (2014)	x	x	x	x	1	2
Cohen and Bennett (1997)	x	x	x	x	1	x
Takagi et al. (2006)	x	x	x	x	x	x
Weil & Belchetz-Swenson (2007)	1	x	x	x	x	x
Rankin et al. (2017)	x	x	x	x	1.1	x
Edwards (2008)	x	x	x	x	x	x
Codes	Preparation	Tools	Reference	Edit reference	Observation	Position

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**Table 1. Codes derived from the literature, part 2**

	Drawing details	Adding texture	Finishing touch	Choice of style	Composition	Simplified objects
Cantrell & Michaels (2010)	x	x	x	x	x	x
Nagai et al. (2014)	5	6	7	x	3	4
Cohen & Bennett (1997)	3	3	x	2.2	2.1	x
Takagi et al. (2006)	2	3	x	x	1	x
Weil & Belchetz-Swenson (2007)	4, 5	6	x	x	2	x
Rankin et al. (2017)	x	x	x	x	1.2	x
Edwards (2008)	0	x	x	x	0	x
Codes	Details	Texture	Finishing	Style	Composition	Simple
	Evaluation	Going to a previous stage	Underpainting	Line	Perspective	Theory
Cantrell & Michaels (2010)	x	x	x	x	x	x
Nagai et al. (2014)	x	x	x	x	x	x
Cohen and Bennett (1997)	4	5	x	x	x	x
Takagi et al. (2006)	x	x	x	x	x	x
Weil & Belchetz-Swenson (2007)	x	x	3	x	x	x
Rankin et al. (2017)	x	x	x	x	x	3
Edwards (2008)	x	x	x	0	0	x
Codes	Evaluation	Loop	Underpainting	Line	Perspective	Theory

**Appendix 2. Table 2. The codebook, part 1**

Code	Short description	Detailed description
Preparation	All actions that precede the process of drawing	While one author describes the process that a 17th-century artist underwent before touching a canvas with a brush, the other paper advised what a digital artist should do before starting an initial sketch. Similarly like a traditional artist chooses and prepares media, a digital artist must find "the most suitable combination of software and hardware"
Tools	The instructions that explain the function of a graphic editor	In a graphic editor, there are a lot of different tools that are similar to analogous. Also, every digital artist must remember a lot of hot key combinations, because they make work faster
Reference	Find a reference image	Before drawing, a digital artist should find photos and images that he will use in work. there might be more than one. Some of them are used for inspiration, some for taking pieces from them and copying to the drawing
Edit reference	Draw on the reference, cut it, use it directly in the image	Some pieces of reference may be used directly in the final image.
Observation	The process of looking at the reference and identifying important features	An artist looks at the reference and analyzes it: compare sizes of different parts, compare value, colors. analyzes shapes, silhouettes
Position	Identifying positions of each part of every object	Drawing complex shapes might include the detailed analysis of every shape
Composition	The position of elements in the picture	It is one of the most important categories in drawing. the place of every element is important for the perception of image. when artists look for a good composition, they gather many factors: value, place, size, negative space, silhouette of the depicted objects

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Code	Short description	Detailed description
Simple	Drawing simple shapes	Some sources advise to begin drawing, simplifying the depicted objects. usually draw simple geometrical shapes (circles, rectangles, squares), then make them more sophisticated and resembling the object as the artist sees it
Details	Work on parts of an image	Depicting objects as good as possible. Adding shades to make an element look more realistic. Adding more colors
Texture	Depict the texture of different objects	Depicting the surface of every object, trying to show the difference of textures
Finishing	Look at the whole drawing and add final touch	Some actions that artists do to make the artwork look finished
Style	The choice of drawing style	A drawing might be photorealistic or more stylized
Evaluation	Feedback on the work done	Analysis of the drawing, comparison with the reference image
Loop	Change something after the evaluation	Return to a finished part of the drawing in order to improve it
Underpainting	The first layer of color	Underpainting covers a large area of a drawing. Underpainting is usually seen through a layer of paint
Line	Line sketching	The initial sketch created with the lines
Perspective	Perspective	The depicting of the transformation of the objects when they are close to an artist
Options	The ability to choose one or another action while drawing	Teacher 2 highlighted that some stages of the drawing might be done differently. He suggests several possible scenarios
Theory	Rules of drawing	This category is related to those teacher's pieces of advice that do not give direct instructions or comments on the ongoing work, but those that represent some broad tips or rules

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*Table 2. The codebook, part 2*

Code	Sources	Key words	Examples
Preparation	Cantrell & Michaels (2010) Weil & Belchetz-Swenson (2007)	Prepare Before the start Before	The teachers did not tell about this steps in the lessons, but all of them checked programs before the beginning, tested tablets and styluses
Tools	Cantrell & Michaels (2010)	Layer Eraser Ctrl Shift Brush Gradient Bucket Blending Instrument Tool	"Let's see which instruments we have here. This button, it's a brush."
Reference	Cantrell & Michaels (2010)	Photo	Teachers did not talk about it during the lesson, but before the drawing session they chose images that the students copied. Students actively participated in this process
Edit reference	Cantrell & Michaels (2010)	Reference Edit	The teachers did not manipulate with the reference image and did not teach that
Observation	Cohen & Bennett (1997) Nagai et al. (2014)	Analytical questions: What is brighter? What is bigger?	"Which colors do you see?"
Position	Nagai et al. (2014)	Part Where	No examples
Composition	Nagai et al. (2014) Cohen & Bennett (1997) Takagi et al. (2006) Edwards (2008) Weil & Belchetz-Swenson (2007)	Composition	"Look at the way that your eye "traveled" in the picture. It happened because there is something special in the composition center. Can you tell me what is good about this composition center?"

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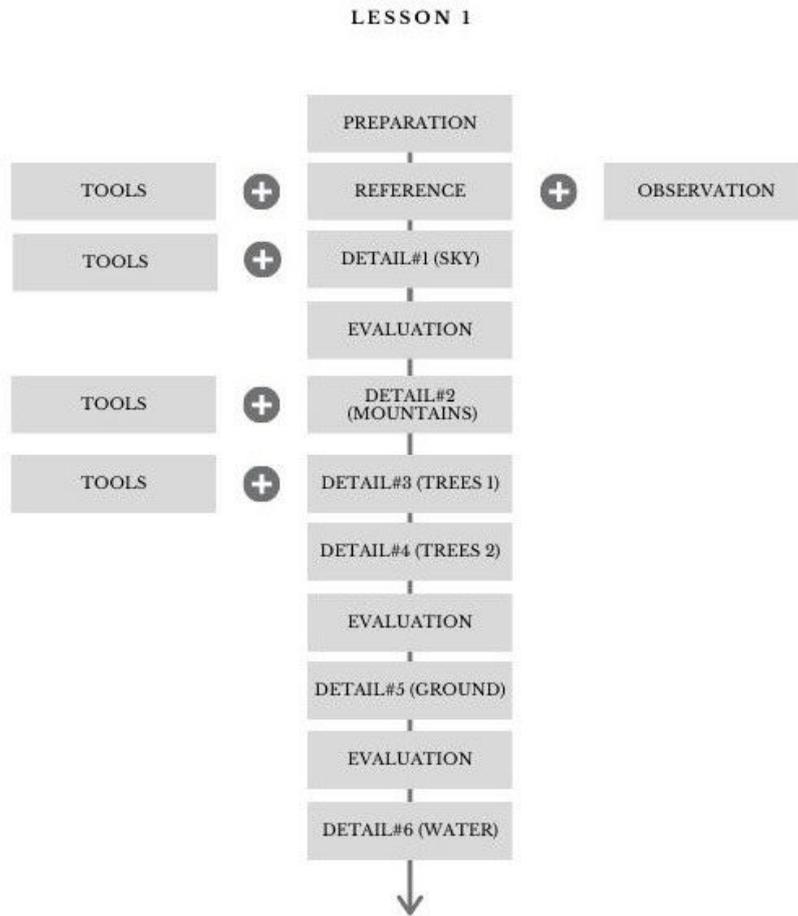
Code	Sources	Key words	Examples
Simple	Nagai et al. (2014)	Without details Big strokes Square Rectangle Circle	"Don't draw a tree, draw a shape of it"
Details	Nagai et al. (2014) Cohen & Bennett (1997) Takagi et al. (2006) Edwards (2008) Weil & Belchetz-Swenson (2007)	The names of the picture elements: Tree Ground Cloud Sky Building	"Then, we need to draw the ground"
Texture	Cantrell & Michaels (2010) Nagai et al. (2014) Cohen & Bennett (1997) Takagi et al. (2006)	Texture	"You may play with textures now"
Finishing	Nagai et al. (2014)	This code appear in the end of drawing session	No examples.
Style	Cohen & Bennett (1997)	Realistic Simplify	No examples
Evaluation	Cohen & Bennett (1997)	Check	"Let's check if we draw every building and then move further"
Loop	Cohen & Bennett (1997)	Change Go back	"Let's look at what we have now(evaluation). Let's go back and paint the sky a bit"(loop)
Underpainting	Weil & Belchetz-Swenson (2007)	Underpainting Background	In lesson 3, a student covers the whole drawing area with a color of the sky. Drawing details, he/she leaves transparent zones, so the color of the first layer adds to every part of the drawing.
Line	Edwards (2008)	Line Sketch	"We will find some composition with lines"
Perspective	Edwards (2008)	Perspective	No examples.

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Code	Sources	Key words	Examples
Options	Teacher 2	Option Choice Way	"Which option do you like? First, you can create a black and white sketch, and then apply colors with top layers. Second, you can draw a colorful image from the beginning."
Theory	Yilmaz et al. (2017) Rankin et al. (2017)	Tip Advice As a rule Usually In theory	"It is easier for beginners to divide the list for three parts. it will be beautiful to use one part for the sky and two parts for the ground. Or in the reversed proportion: 2/3 for the ground and 1/3 for the sky"

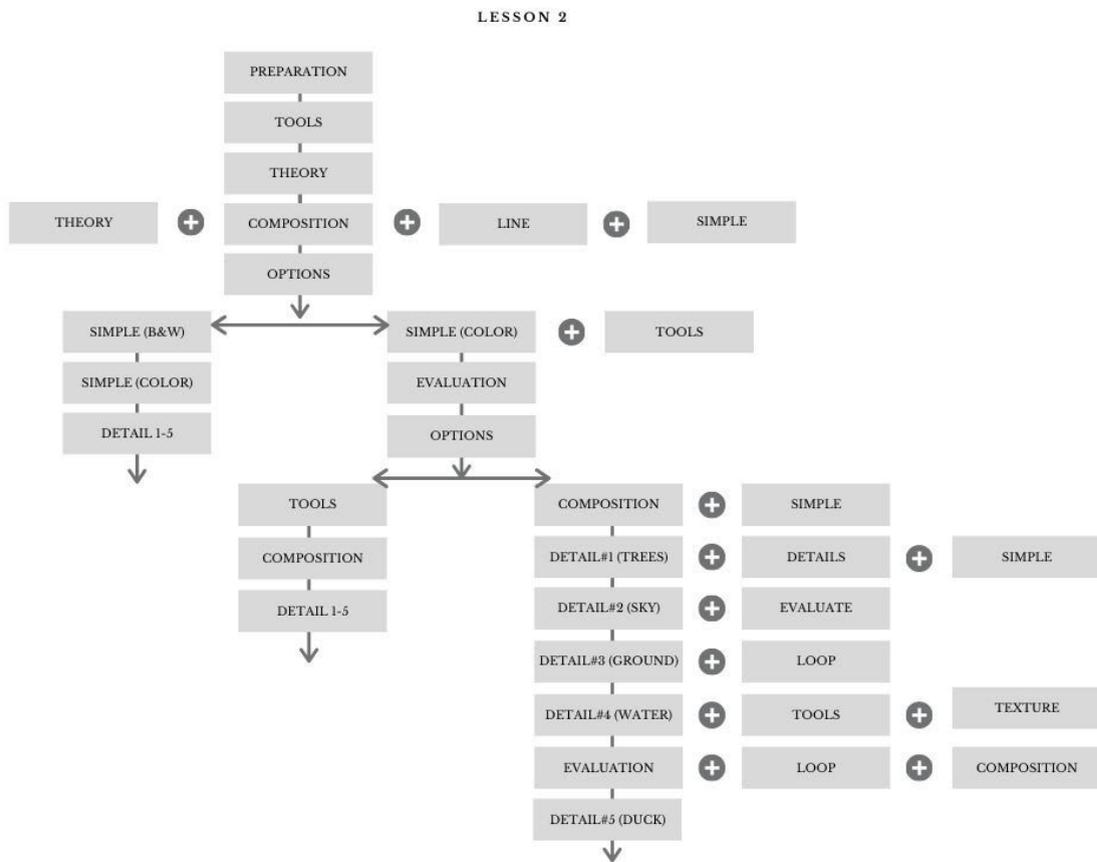
# CREATING GUIDELINES FOR LANDSCAPE DRAWING IN DIGITAL MEDIA

Appendix 3 . *Figure 2. The codes from lesson 1*



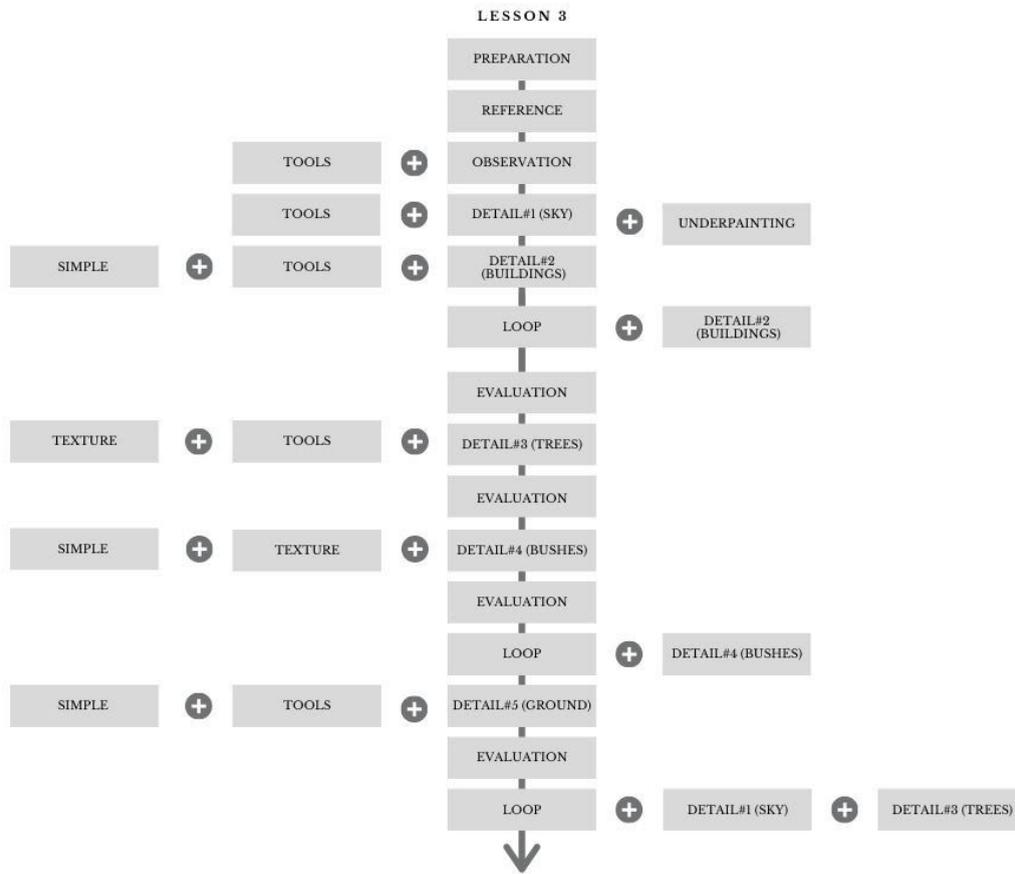
# CREATING GUIDELINES FOR LANDSCAPE DRAWING IN DIGITAL MEDIA

Appendix 4. Figure 3. The codes from lesson 2

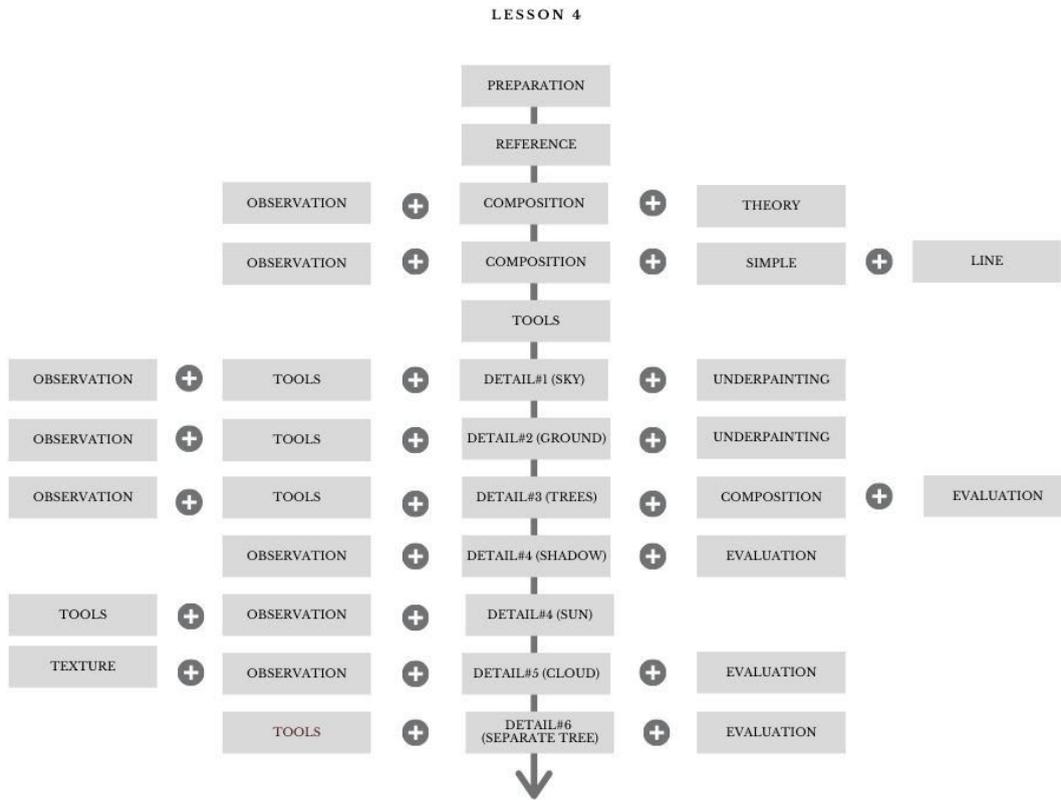


# CREATING GUIDELINES FOR LANDSCAPE DRAWING IN DIGITAL MEDIA

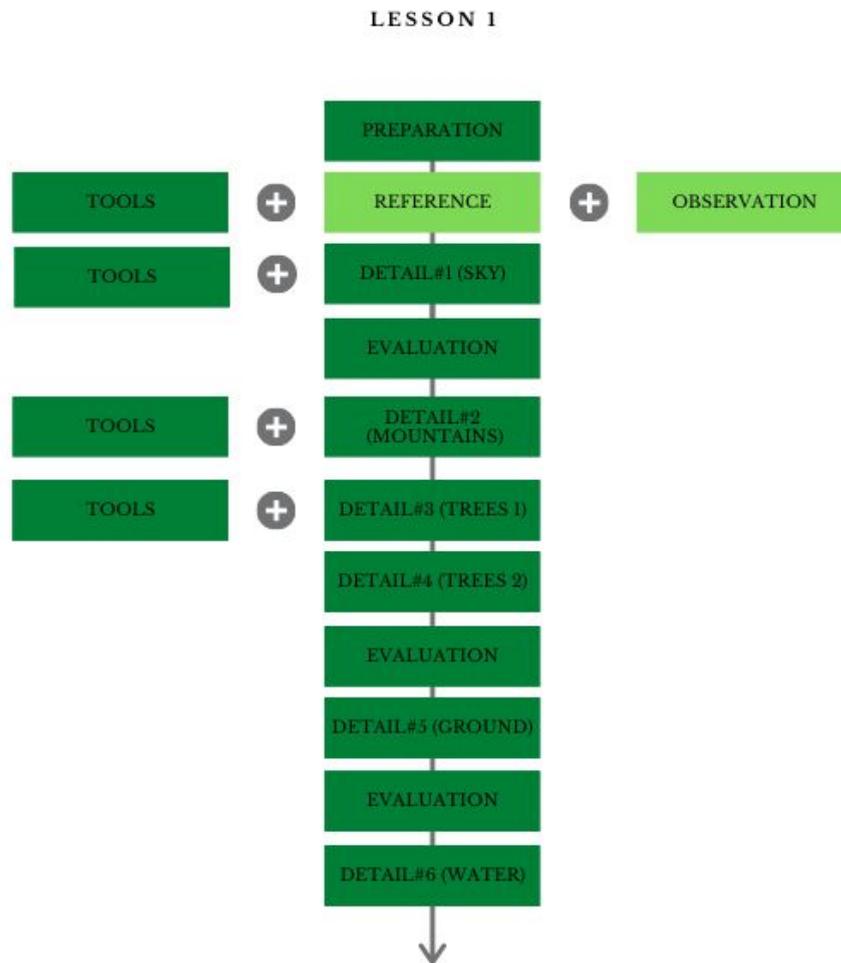
Appendix 5. Figure 4. The codes from lesson 3



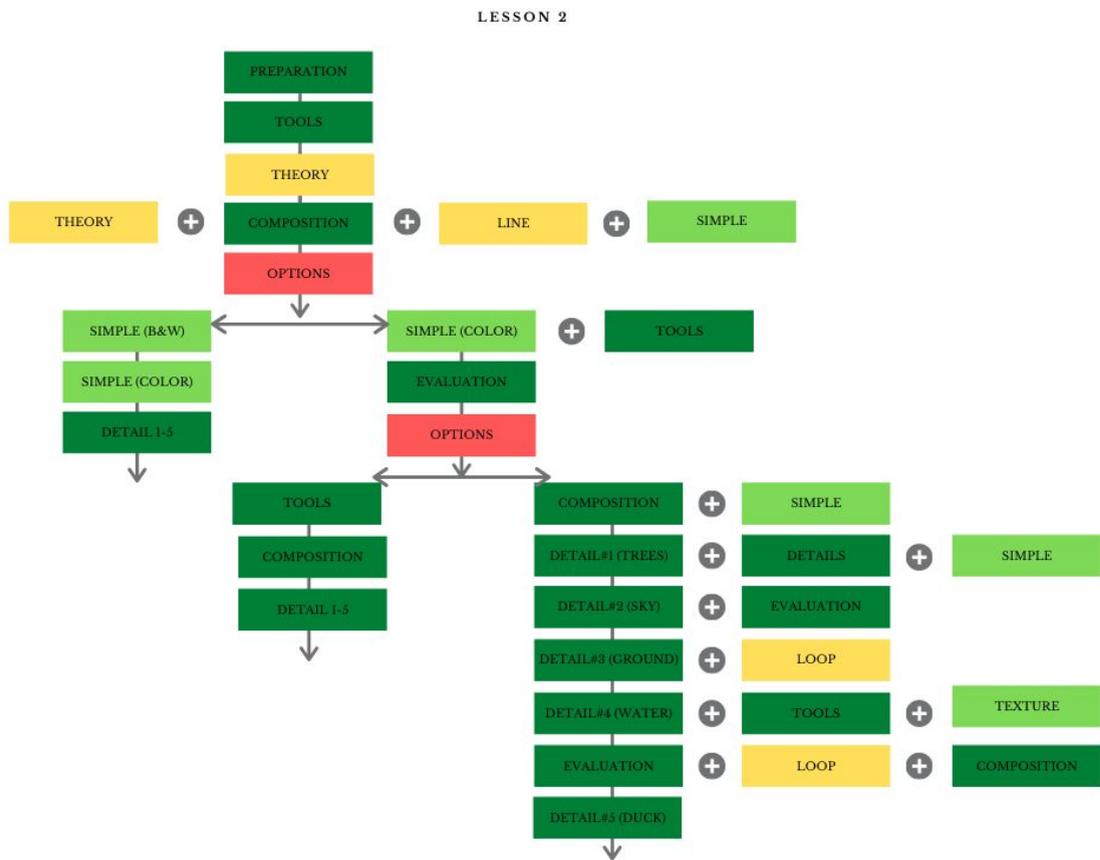
Appendix 6. Figure 5. The codes from lesson 4



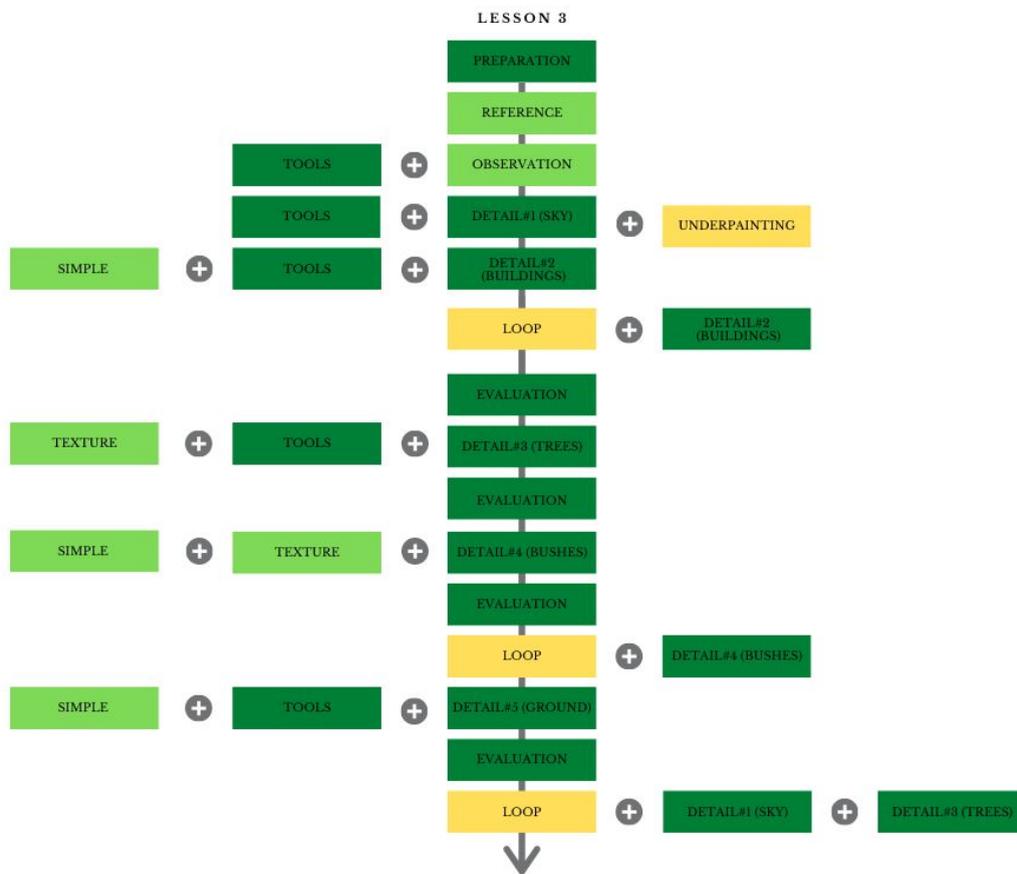
Appendix 7. Figure 6. Lesson 1, color-coded



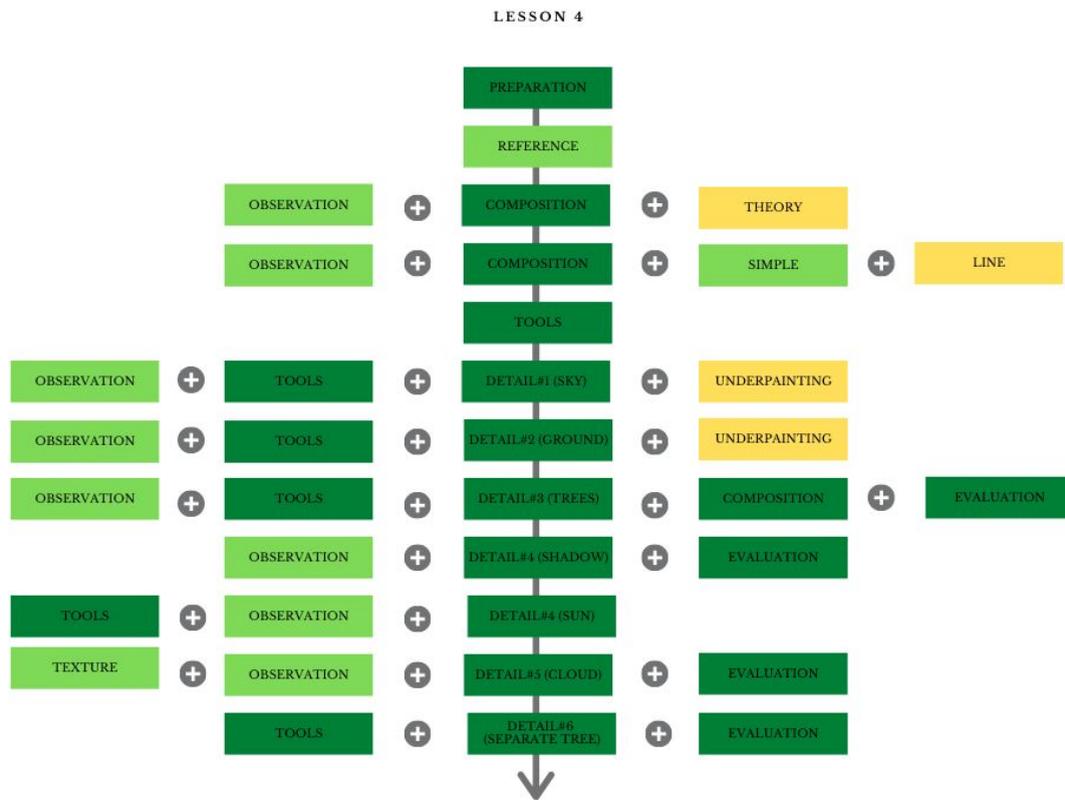
Appendix 8. Figure 7. Lesson 2, color-coded



Appendix 9. Figure 8. Lesson 3, color-coded



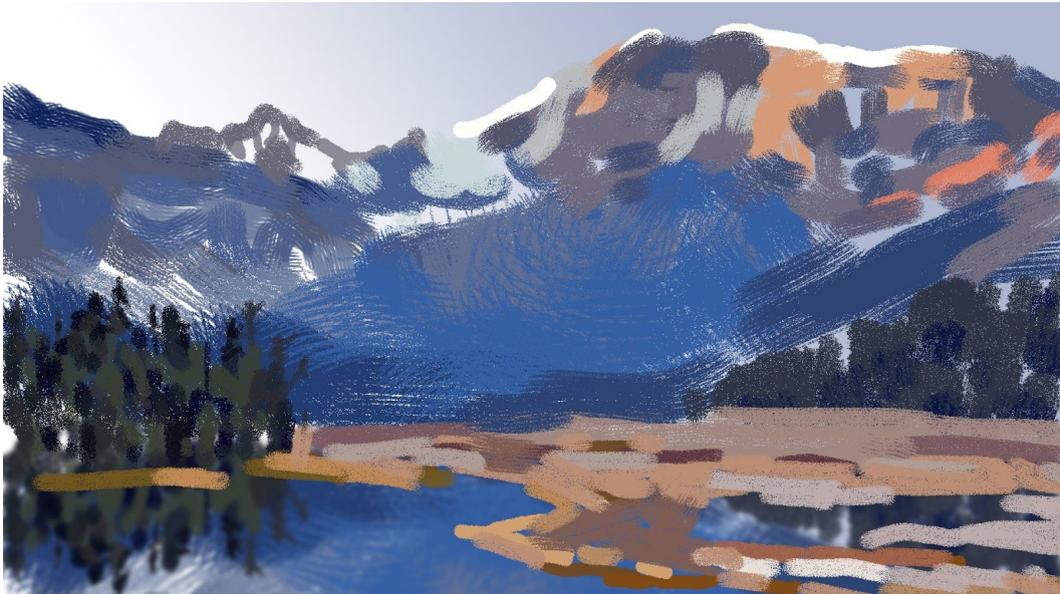
Appendix 10. Figure 9. Lesson 4, color-coded



**Appendix 11. *Figure 11. The students' drawings, created during the recorded lessons.***

**Lesson 1.**

The total length of the lesson was 55 minutes. A student had some experience with digital and analogous drawing.



**Lesson 2.**

The total length of the lesson was 65 minutes. A student had experience neither in digital nor analogous drawing.



**Lesson 3.**

The total length of the lesson was 55 minutes. A student had experience in only traditional drawing.



**Lesson 4.**

The total length of the lesson was 95 minutes. A student had experience neither in digital nor analogous drawing.



**Appendix 12. Research-informed consent form**

## **Research Informed Consent**

### **TITLE OF STUDY**

***CREATING GUIDELINES FOR LANDSCAPE DRAWING IN DIGITAL MEDIA.***

### **PRIMARY RESEARCHER**

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### **PURPOSE OF STUDY**

Determine teaching methods that are currently available on the Russian market in the digital landscape drawing field. Compare the existing digital teaching trends and pinpoint the most effective methodology, either discovered during the research process or designed by combining several examples. The present study is conducted as a part of a thesis in the MA “Educational Technology”, University of Tartu.

### **PROCEDURES**

observation of one lesson  
video recording of the lesson  
audio recording of the lesson  
screen recording of the lesson

### **CONFIDENTIALITY**

Please do not write any identifying information.

Every effort will be made by the researcher to preserve your confidentiality including the following:

- Assigning code names/numbers for participants that will be used on all research notes and documents
- Keeping notes, interview transcriptions, and any other identifying participant information in a locked file cabinet in the personal possession of the researcher.

Participant data will be kept confidential except in cases where the researcher is legally obligated to report specific incidents. These incidents include, but may not be limited to, incidents of abuse and suicide risk.

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## CONTACT INFORMATION

If you have questions at any time about this study, or you experience adverse effects as the result of participating in this study, you may contact the researcher whose contact information is provided on the first page. If you have questions regarding your rights as a research participant, or if problems arise which you do not feel you can discuss with the Primary Researcher directly by telephone at +7 981 882 0987 or at the following email address [petvovna@gmail.com](mailto:petvovna@gmail.com).

## VOLUNTARY PARTICIPATION

Your participation in this study is voluntary. It is up to you to decide whether or not to take part in this study. If you decide to take part in this study, you will be asked to sign a consent form. After you sign the consent form, you are still free to withdraw at any time and without giving a reason. Withdrawing from this study will not affect the relationship you have, if any, with the researcher. If you withdraw from the study before data collection is completed, your data will be returned to you or destroyed.

*Note: Please delineate the "Consent" section of the Informed Consent Form by drawing a line across the page (like this - ~~Example~~). This delineation is important because the consent form grammar shifts from second person to first person, as shown in the example.*

## CONSENT

I have read and I understand the provided information and have had the opportunity to ask questions. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason and without cost. I understand that I will be given a copy of this consent form. I voluntarily agree to take part in this study.

**Participant's Signature** \_\_\_\_\_ **Date** \_\_\_\_\_

**Researcher's Signature** \_\_\_\_\_ **Date** \_\_\_\_\_

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Antonina Korepanova,

04/06/2020