

Character Development: Bridging Digital and Traditional Drawing Techniques

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ABSTRACT

The investigation delves into the reciprocal relationship within character drawing and its digital applications, particularly concerning the structured representation and evolution of characters. The study assigned a task to two distinct groups of students: one group opted for traditional methods of concept drawing, while the other utilized graphics tablets and digital applications. The task centered around character development, emphasizing the correlation between skeletal volumes and body shapes, articulation mobility, and the interplay between cranial volume and facial expression. Upon analyzing the concepts developed by the students regarding the theme, several criteria were considered. Paramount among these were the stability, logic, and coherence in supplementing anatomical forms, the clarity and detailing of the drawings, the complexity of character portrayal, its communicative efficacy, and expressive depth. The findings substantiated the initial hypothesis, demonstrating that constructive drawing with digital support offers distinct advantages in stabilizing conceptual foundations. Specifically, the method of constructive drawing with digital tools significantly contributes to the realization of the character.

Keywords: Digital tablet, Drawing, Traditional drawing, Digital painting, Character design

INTRODUCTION

The digital painting possesses several distinct characteristics that set it apart from traditional drawing. These aspects influence the working method and the stages an artist undergoes to develop and stabilize a character. They enable a clearer ordering of the relationship between the structure and function in character drawing, positively impacting the clarity and coherence of visual information.

We have been concerned with the differences between practices on traditional media and digital painting to enhance students' skills. The working hypothesis is represented by the advantage of the bidirectional method in structuring the character. Validation of the method was achieved by employing digital tools compared to those used in traditional media. In the past two decades, studies and concerns that delineate the dynamic elements of the interaction between the human user and the working environment (traditional material/graphic tablet) have been published.

In 2000, Tzafestas argued for the significance of digital tools that leverage the dexterity of traditional drawing. He referred to the potential for developing behavioral models and algorithms for regulating parameters in

digital painting, such as color, through the use of the brush line. In 2007, Chin and Tan reported on the results of an exploratory study on the impact of graphic tablets on users' graphic synthesis capabilities. In their study, they highlighted the value of the tablet as a thinking tool, a teaching and learning instrument, and a platform for documenting design thinking. In 2008, Beryl Plimmer asserted the existence of a natural and intuitive interaction with the computer for tasks involving document markup and sketching. Usability testing for dominant pen-based software revealed a connection with the operating system. However, when users were more accustomed to the keyboard and mouse, they tended to opt for this familiarity over the use of a pen.

Budiman et al., analyze the impact of hand drawing on cognitive capacity, asserting that today, more than ever, its significance needs to be upheld on practical grounds. Sitdhisanguan and Amornchewin introduced the concept of mobile learning, and in their study, they discussed the effectiveness of digital-supported learning.

The structuring of the character is significantly better supported in a bidirectional approach that involves developing the concept in two directions:

- From the exterior of the character towards the interior, determining solid/skeletal volumes and skeletal references.
- From the interior, back towards the external forms, by adding soft parts.

Continuing, we will refer to this approach as 'out-in-out' for simplification purposes.

Motivation, Description, Method

The method "out-in-out" is utilized to stabilize character drawing and holds innovative characteristics within the discipline of Art Anatomy for the development of animation and gaming characters within our department. It's well-known that initial efforts in the learning phase of character drawing are often characterized by an immediate lack of or delayed stabilization of the character's morphology. Beginners are frequently tempted to alter the character's morphology with each subsequent representation, driven by the desire to perfect the character.

The beginner's temptation lies in constantly attempting to improve the character with each representation. These successive representations encompass a range of poses, attitudes, body geometries viewed from different angles: anterior, posterior, lateral, semi-anterior profile, semi-posterior profile, and even superior or inferior perspectives. The "out-in-out" method proposes an intermediary solution for these successive representations through the use of interior-skeletal solid volumes.

The character's morphology, obtained through a free discourse between vision and hand drawing, is broken down into solid volumes of the torso, cranial extremities, and according to the straightforward directions of the axes of the upper and lower limbs. To render these solid skeletal volumes, students are encouraged to employ ovoid forms and sections through ovoid shapes. The method involves the representation of volumes and the reconstruction of soft parts in the drawing, based on the previously obtained solid skeletal

volumes. Students are prompted to identify the solid references and rely on simple geometries for representation. These simple geometries facilitate a consistent solid structure, thereby ensuring stability for the character across successive representations.

We aim to verify the hypothesis by supporting the graphic process with the assistance of a tablet and specialized software. Digital applications enable the early inclusion of synthetic forms for the internal components that will ultimately determine the character. Applied anatomy and artistic anatomy elements can more clearly find their place and role using digital applications. Characters developed in this manner will exhibit greater graphical representation efficiency and message expressiveness.

The hypothesis verification considered the characteristics of the complex system developed between the artist and the digital representation environment. In this creative system, the student's creativity represents the input introduced into the digital subcomponent. The output consists of the character development stages, reproduced and understood at the digital level.

Summarizing the characteristics of the interaction between the student and the graphic tablet:

- A much easier working scale.
- Drawing depth or details can be more easily modified according to the needs of the construction drawing.
- Sensory feedback from the pen, the digital drawing surface, roughness, and latency.
- The equivalence between the student's projective content and the character's detailed content is achieved much more easily.
- Overlaying planes and consequently, the internal anatomical structure with the external structure.
- For fantastical and imaginary characters, veracity is replaced with an anatomical logic of the relationship between the external form and internal structure.

STUDY GROUP AND ASSIGNMENT ADMINISTRATION

The study involved six first-year students enrolled in the graphic design specialization. Three of them had prior experience in character drawing. All students were in the early weeks of their studies. All six students received the same task: to identify the formal premises for an animation or gaming character (creating a character through sketching or construction drawing). The time allocated for responding to the task was 3 hours. The specific focus was the 'out-in-out' methodology. According to the teachings of the out-in-out method, students transitioned from the forms of soft, external parts to the shapes of internal skeletal volumes. This process continued with reconstructing the external form by adding to the skeletal volumes to obtain a complete figure with a morphology closest to the initial concept. The entire out-in-out process was conducted twice: freehand on A3-sized drawing board - the traditional method - and freehand on a graphic tablet - digital painting (Figure 1, Figure 2 and Figure 3). Classic materials such as drawing board and graphite were used, along with digital support. The digital tablet support was provided for models without a touch screen.



Figure 1: Transitioning from the forms of soft, external parts to the shapes of internal skeletal volumes – hand drawing, traditional, graphite on paper. (Source: student work. Stages of character identification.)



Figure 2: Transitioning from the forms of soft, external parts to the shapes of internal skeletal volumes – digital drawing, tablet. (Source: student work. Stages of character identification.)



Figure 3: Transitioning from the forms of soft, external parts to the shapes of internal skeletal volumes – digital drawing, tablet. (Source: student work. Stages of character identification.)

RESULTS

A total of twelve responses to the task were obtained, with six in a traditional manner and six in a digital format. The final digital images were saved in JPG format with a resolution ranging between 200 and 300 DPI. Traditional representations were made on A3-sized drawing board.

Out of the responses, four attempted to initiate a character from the human body, while two created a zoomorphic concept. Photographs were taken during the task to capture the students' working positions and postures. The work surfaces were horizontal, allowing the arrangement of both digital and traditional devices around each user. Students grouped themselves in the room according to their preferences, with no strict imposition regarding the organization of the workspace.

The resulting concepts were evaluated by three evaluators selected from among the doctoral students.

A questionnaire was administered to report on the subjective experience comparing traditional drawing with tablet-based drawing. The questions were directed at personal experience and expectations for future practices in graphic creation. The questionnaire had the role of verifying and validating the evaluations of the results and consisted of five questions:

1. Comparing traditional and digital methods, which was easier for you to depict the complete form of the character in your drawing?
2. Was building and positioning the solid-skeletal forms easier to accomplish in the digital or traditional variant?
3. Between the two methods, which was easier for you to reconstruct the soft parts and the character's attitude based on the solid volumes?
4. Express in one word the strong point and weak point of each of the two methods.
5. Which method will you use in the future to stabilize the character?

The students' obtained concepts were evaluated using the following criteria:

- Stability of the Concept
- Logic and Coherence in the Complementarity of Anatomical Forms
- Drawing Clarity and Detail
- Character Complexity
- Character's Capacity to Convey a Message and Be Expressive

Each criterion was assessed on a scale from one to five. A score of one represents the lowest value while five represents the highest for fulfilling the analysis criterion. Each criterion was evaluated for each piece of work by the three evaluators. Elements considered in the evaluation for each criterion were the following:

Evaluation of Concept Stability:

- Constant Maintenance of Bone and Muscle Landmarks: Ensuring that these landmarks remain consistent, regardless of the angle of incidence or body posture.

- **Consistency in Segments Proportions:** Maintaining the same proportions between segments delimited by landmarks in different poses. Stability criterion primarily focuses on the facial and physiognomic region, especially if derived from the human face.

Evaluation of Complementarity of Anatomical Forms

- **Logical Arrangement of Soft Tissue over Skeletal Forms:** Ensuring the logical arrangement of soft tissue forms over skeletal forms.
- **Coherence in Postural Curve Sequences:** Consistency in the sequence of postural curves.

Assessment of Drawing Clarity and Details

- **Visual Discrimination and Intentional Aesthetic Line Qualities:** Evaluating the intentional and aesthetic nature of lines.

Measurement of Character Complexity

- **Presence of Body Volumes:** Assessing the presence of trunk volumes, upper and lower limb volumes, and cranial extremities.
- **Inclusion of Clothing and Accessories:** Evaluating the presence of clothing items and accessories.

Examination of Character's Message and Expressiveness

- **Facial Dynamics in Different Poses:** Assessing the dynamism of facial expressions in different poses.
- **Coherence between Expression and Postural Support:** Evaluating the coherence between the character's expression and the supporting posture.

These elements reflect the functional system in the evaluation process, considering the student's work within the digital working environment and their task completion.

Table 1. Students' obtained concepts evaluation; by each evaluator (sum) and for traditional (T) and digital (D) drawings.

Criterion	Evaluator 1		Evaluator 2		Evaluator 3	
	T	D	T	D	T	D
Stability of the Concept	24	28	23	27	25	28
Logic and Coherence in the	23	28	24	28	24	27
Complementarity of Anatomical Forms						
Drawing Clarity and Detail	28	24	28	24	27	24
Character Complexity	27	25	24	23	28	24
Message and expression	24	23	27	28	24	23

Analysis of the questionnaire responses: Regarding the first question in the questionnaire, four out of the total students indicated that traditional drawing on paper is more useful and familiar for fully identifying the character. However, the establishment and refinement of solid-skeletal volumes were found to be much easier on the digital platform. Four students in total

mentioned that recomposing the soft parts and character attitude is more easily accomplished digitally. The words used to describe the strengths of the digital platform were: speed, efficiency, ease, assistance, clarity, and reduced project completion time. For the strengths of traditional paper-based drawing, terms such as ease, skill, familiarity, and convenience were employed. Terms highlighting the weaknesses of the digital platform were: complexity, difficulty, unfamiliarity, heaviness, and cost. As for the weaknesses of traditional drawing on paper, mentioned aspects included material consumption, excessive workspace, lack of precision, proportional approximation, transitioning from paper to digital medium, and lack of exercise in drawing. Among the six surveyed students, three stated they would use the traditional drawing method, while the other three preferred digital drawing.

Table 2. Questionnaire content and and response sources.

Students attitude and behavior	Corresponding questions
personal experience	Comparing traditional and digital methods, which was easier for you to depict the complete form of the character in your drawing? Was building and positioning the solid-skeletal forms easier to accomplish in the digital or traditional variant? Between the two methods, which was easier for you to reconstruct the soft parts and the character's attitude based on the solid volumes?
future practices in graphic creation	Express in one word the strong point and weak point of each of the two methods Which method will you use in the future to stabilize the character?

CONCLUSION

The out-in-out method, developed distinctly in the two manners, allows for an incursion into the fundamentals of character forms and morphology. The differentiated response of the students fuels the research we conducted, sharing both arguments for digital and traditional character drawing. Users felt more comfortable defining the skeletal, solid form digitally, considering that proportions and dimensions can be managed through layers, thus ensuring the continuity of these volumes.

The results obtained through initiated concepts and questionnaire evaluations lead to the conclusion of a shared practice in acquiring drawing skills. We remain convinced of the formative value of hand drawing through traditional means, alongside the informative value of drawing on digital media. The formative and propaedeutic value brings the epistemic content of art academies, combined with the values encompassing construction, detailing, and expressiveness in drawing in its simplest forms: soft graphite on drawing paper.

The method of drawing on digital platforms offers advantages in developing a system between the creator components (student-artist), a digital system

for transferring and modeling the drawing, where the input is the task, and the output is the creation presented informatively with the entire apparatus for calibrating precision in highlighting contrasts and details, aided by using layers.

The conducted research highlights the benefits of hand drawing for students lacking prior drawing experience. Students experienced in hand drawing find the digital support useful and appreciate it for achieving new and specific performances. In the phase of seeking and conceptualizing, drawing freely from imagination is useful for description but not for explanation and redundancy.

Constructive drawing, using the advantages of digital support as a result of the student-computer interaction, is what proposes the character in all the explicit complexity of the connection between internal anatomical structure and external conformation.

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